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N.A.R. TRAIN LEAVING PEACE RIVER VALLEY

THE UNIVERSITY OF ALBERTA

THE NORTHERN ALBERTA RAILWAY: A GEOGRAPHICAL ANALYSIS

by

© DENZIL FRANK ALFRED GARRETT

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "The Northern Alberta Railway: A Geographical Analysis", submitted by Denzil F. A. Garrett in partial fulfilment of the requirements for the degree of Master of Arts.

ABSTRACT

This thesis examines the origin and growth of the Northern Alberta Railway, and briefly describes the role it has played in the development of the region it serves, its contribution to the economy of Northern Alberta, and assesses its present functions, and possible services in the future. Although studies of individual rail systems have not been emphasized in transportation geography in recent years, such works still constitute a significant and relevant part of this field of study.

A brief historical background of the evolution of this railway system from a disparate group of railway companies to a dynamic and dominant force in the movement of goods and people in the decades prior to 1950, initiates this study. This is followed by a survey of the period 1950 to 1969, an era marked by greatly increased truck competition and associated declines in certain types of railroad traffic.

The study then analyzes the flow patterns of the commodities moved into and out of the region by this railway, revealing the spatial interaction between a sparsely peopled area which exports its products of agriculture, forest and mines to national and international markets, and those sources from which are imported most of the materials and equipment required to service these

activities, and which also provide the consumer goods for the inhabitants.

It may be concluded from this study that the Northern Alberta Railway has proved to be a powerful instrument of economic change, an important stimulus to settlement and an incentive to the development of the agricultural, forest and mineral resources in the regions it serves; in addition, it has also fostered increased mining activities in the Far North. In recent years, this railway has evolved into an important inter-modal transportation system serving Northern Alberta. Furthermore, the study indicates that changes over the years in the movement of certain traffic by rail may be attributed to rate policies, government regulations, lack of premium service, and the comparatively slow initiation of technological innovations. The general impact that rail transport will have on the patterns of activity in the future will depend to an extent on the timely implementation of changes in the aforementioned factors.

ACKNOWLEDGEMENTS

The research, writing and preparation of this thesis involved the assistance and co-operation of numerous people whose contribution is hereby gratefully acknowledged by the author. Information dealing with the historical background of the Northern Alberta Railway was gleaned from government archives, news reports pertaining to that time, and interviews with railway officials, personnel, and numerous 'old-timers' who had served this railroad during the early years.

Appreciation is expressed to all those members of the railway, particularly the staff at the N.A.R. Headquarters. All statistical data was acquired from the records maintained at this office, access to which was granted by the General Manager, the late Mr. Kenneth Perry, who gave much of his time to discuss the many intricacies involved in traffic management and operations. In this respect, Mr. J. O. Pitts, the present General Manager, was also very helpful.

Mr. James Dove, Traffic Manager and other members of the Traffic Department, notably Mr. George Mather, and Mr. Ken Craik, Assistant Traffic Managers, were most helpful in placing before me all traffic data that was required. Mr. Craik was invaluable in this respect, and together with his colleagues, assisted me in the interpretation of traffic data, the classification of commodities,

and in the breakdown of statistical information. Recognition is also due Mr. D. Tinston, the Comptroller, for his assistance, and to Mr. Ed. Holtner for his kindness in permitting me to use some of his photographs which have been used in this work.

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Mention must be made of Mr. James Telford, Alberta Freight Bureau, who aided considerably in the traffic flow data for road transport; in addition, officials in the Alberta Department of Highways, as well as the Alberta Research Council, were kind enough to acquire and disseminate for me, information pertaining to the development of the road and highway network, and population and other relevant data, respectively.

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Denzil F. A. Garrett

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CHAPTER ONE

INTRODUCTION

Transport facilities are generally considered to be one of the most important factors influencing the pattern of economic activities in an area, "the formative power of economic growth" (Voight 1967) and their role has been succintly summarized by Wilfred Owen:

> "Transport is a necessary ingredient of nearly every aspect of economic and social development. It plays a key role in getting land into production, in marketing agricultural commodities and in making forest and mineral wealth accessible. It is a significant factor in the development of industry, in the expansion of trade, in the conduct of health and education programmes and in the exchange of ideas." (Owen 1964)

Transportation becomes a critical factor in regional growth since it influences the extent to which an area can utilize its resource endowment for generating exports. In effect, the competitive ability of a region is influenced by the abundance of its materials, the size of and distance to its markets, the cost of its labour force, and the agglomeration factors of its urban centres. Because these four factors vary geographically, regions differ in the pull that they exert on transport and industry.

The role of transport in economic and regional development has been a subject of academic interest as well as of great practical importance. In 1952, Penrose observed that "transport and com-

munications are prominent among the areas of study that have not yet received sufficient attention from economists or from geographers." (Penrose 1952). "Such study as has been undertaken by either", reiterated Hoyle in 1973, "has generally approached the subject from the aspect furthest removed from the other discipline." (Hoyle 1973). Transport geography thus has been concerned with the effects of economic activities on transport patterns, for example (Van Dongen 1954), or with descriptions of traffic flows within a transportation complex, for example (Gould 1960), or with an explanation of commodity movements in a geographic or political region, for example (Smith 1962). Transport economics, on the other hand, has paid better attention to transportation and numerous works entitled, "Economics of Transportation" are witness to this, for example: Bonavia (1947), Healey (1949), Fair and Williams (1950), Kirkaldy and Adams (1950), Sherrington (1958), Locklin (1960), Currie (1967), and Prest (1969). Most of these works, however, after a brief introductory chapter on the importance of transport to the economy, "concern themselves with competition between the different modes of transport, government ownership, pricing regulations, and freight rates among other things, with no specific spatial dimensions to the topics. They have not been concerned with the effect of transport on economic activities and the influence of these activities on transport." (O'Connor 1966). "After almost twenty

years of study", laments Gauthier, "there exists no consensus on the role of transportation in the development process." (Gauthier 1973).

Since then, research and writings on transport studies by both economists and geographers have expanded into a number of facets of transportation and in recent years, an "increasing degree of interdependence between the two disciplines has begun to emerge." (Hoyle 1973). There has been, for example, an increasing recognition by economists of the importance of the spatial variable and by geographers of the value of economic models and generalizations. "The transport-development relationship", said Hoyle, "is essentially a two-way interaction process and the results of the interaction depend upon the type of economy involved." (Hoyle 1973).

Whilst much of the literature on transportation and development is concerned with the transport section or system as a whole, some attention has also been paid to specific modes and their impact on the economic development of regions. "It is also possible", said Hurst, "to view transportation horizontally, by looking at specific amalgams of transport routes, modes, networks, and flows." (Hurst 1974).

A fairly wide range of material on highway impact studies has been provided by the Bureau of Public Roads, U.S. Department of Commerce (1963-64) as well as U.S. Highway Research Board

Bulletins (1959, 1960, 1967). Through its Transport Research Centre, the Brookings Institute (Washington, D.C.) has also yielded some important studies on the role of highways in development (Owens 1964, 1968; Wilson et al 1966; Fromm 1967). In addition, there are the works of Garrison and Marts (1958), and Garrison et al (1959), all of which are comprehensive studies of their kind pertaining to the role of highways in economic development.

The importance of rail transport as a vital factor influencing economic development in the regions served has also been recognized as a legitimate field of study within transportation geography (Hurst 1974). Rostow identified the railroads as the stimulus for the 'take-off' stage of economic growth in the United States (Rostow 1960) and Hunter has shown that "railways have been instrumental in lowering shipping costs, widening markets, and to permit economies of large-scale production in a wide range of activities." (Hunter 1965).

That rail transport has been a contributory factor to economic growth in many regions of the world is amply demonstrated by the many research works in evidence, for example: Holmstrom (1934), Jenks (1944), Abramovitz (1955), R. Taaffe (1960), Cootner (1963), Johnson (1964), Thomas (1964), Mitchell (1964), Fogel (1962, 1964), Fishlow (1965), Hazelwood (1965), Nerlove (1966), O'Connor (1966), and McLelland (1968), to name a few.

Almost all of these studies are in agreement with Holland Hunter who said that, "there is a causal linkage between low cost (rail) transportation and economic development." (Hunter 1965). Though the role of rail transport has been thus examined from time to time, relatively little has been done concerning the role that a specific railroad has played in shaping the patterns of economic activities and its contribution to the development in the area it serves, as well as the subsequent effect that these economic activities have had in determining the present day patterns of transportation. As Hoyle remarks:

> "Railways have often assumed a particular predominance in transport systems, because in many cases a railway has acted as a major initiator of development and has tended to dominate subsequent patterns of growth, both in the transport sector and elsewhere." (Hoyle 1973)

True studies have been done of the functions of particular railways and their patterns of commodity flow, or in some cases, their impact on the regions they serve. Such works include those of Gerhke (1952), Wallace (1958), Frank Thomas (1960), Meinig (1962), Yegorova (1964), and Brown (1971), all of which are investigations of specific functions of a railroad. However, Gerhkes' study is devoted largely to the competitive role of the railway in its region and is devoid of commodity flow data, while Wallace's work seems concerned with the general levels and patterns of total flow, density and direction of traffic. Frank

Thomas' comprehensive work not only assesses commodity flow and movement on the Denver and Rio Grande Western Railroad, but attempts to relate flows with production patterns. While Meineg's study is essentially a comparison of the historical backgrounds of two railway systems, Yegorova's work is a brief analysis of the economic effectiveness of the Lena Railroad; and Brown's thesis is an examination of the impact of the Great Slave Lake Railway on agriculture in the region it serves.

Notwithstanding the North American studies previously mentioned, Hurst felt that such research had been unduly ignored during the 1960's and early 1970's. He remarked that the recent emphasis on network analysis had, "meant that studies of specific modes have tended to be pushed into the background", and went on to say that, "as a vital part of the transportation subsystem, with unique spatial characteristics, this neglect is unwarranted." (Hurst 1974)

In light of Hurst's comment, it was felt that a study of an important regional railway system in Alberta, the Northern Alberta Railway, would be a useful contribution to this area of transportation geography. Accordingly, the purposes of this study are to: i) examine the historical development of this railway system; ii) study the changing traffic flows and competitive position of this railway through time; and iii) make a detailed analysis of particular commodity flows in a given year.

This railroad has played an important role in developing the area it serves into a region of specialized economic acitivity. This area produces commodities destined for the international, national, and local markets and in turn, relies to a considerable extent upon distant sources of supply of food, clothing, machinery, and a variety of manufactured goods for the inhabitants of the region. The subsequent effect that such specialized types of economic activity have had in determining the present day patterns of transportation will be reflected in the nature and volume of commodities on the rail route. To this end, maps and diagrams have been used as tools of analysis in presenting the flow patterns.

It should be stressed that this railroad is being considered not as an autonomous segment of the economy of the region, artifically isolated from its natural and cultural environment, but rather as a primary integrating force, grouping the economic activities into coherent patterns of spatial organization and land use.

Although the study focuses strongly on conditions within the last decade - hereafter termed 'current or present conditions' - and analyzes recent patterns of commodity flows, considerable attention has been paid to the history of the railroad, its role in regional development and its evolving function within the transportation system of Northern Alberta for, no rail net of any real

complexity can be adequately understood apart from the processes of its formation.

> "Areal patterns are rarely as simple as they seem, and to divorce the pattern from the process is an invitation to error. While it is true that present 'functional patterns' within rail nets can often be closely related to apparent patterns of cities, economic regions and facilities, it is false to assume that these covariances 'explain' the basic framework of the rail net itself. And that framework can only be explained by the processes which created it." (Meineg 1962)

This study will, therefore, be presented in two parts. Part I describes the historical development of the railway, tracing its evolution from the time of its inception as privately owned lines in 1907 up to the end of 1949. This will be done in three phases:

1. <u>1907 - 1920</u>: The early years of the railway during which the charters authorizing the construction of the lines were granted.
2. <u>1920 - 1929</u>: The period of consolidation in which time these privately owned lines were extended and later taken over by the Provincial Government, leased to the Canadian Pacific Railway for a brief period and subsequently purchased jointly by the Canadian Pacific and Canadian National Railways and incorporated as the Northern Alberta Railways.
3. <u>1930 - 1949</u>: The era of railway dominance in freight and passenger movement during which the growth and increasing density of traffic was rapid.

Throughout these stages of the development of the Northern Alberta Railways, several inter-related themes such as the growth of population and settlements, political interests and decisions, commodity movements, the spatial location of socio-economic activities and the growth of regional centres are all woven together.

Part II, which is the main part of this study, deals with the period of time from just after World War II up until the year 1978. It will be presented in three stages:

1. 1950 - 1959: The development of a comprehensive network of good roads and highways, and the growth of truck competition. While the main focus of attention is on the railroad, attention must be directed to the rapid development of roads and motor transport in the regions served by the N.A.R. Up until the second World War, the railway was the only practicable means of moving large volumes of commodities overland, the roads sufficing for local haulage and as feeders to the railway net. After the war, motor transport had so evolved that, besides continuing to subserve these functions, it was now in direct competition with the railway for the movement of certain goods. In addition, other railroads, as well as other modes of transport like pipelines, appeared on this scene of

expanding competition. Therefore, one chapter has been assigned to deal with road-rail as well as other competitive modes of transportation.

2. <u>1960 - 1969</u>: The last decade and patterns of commodity flow. In this stage of the study, the focus is on the pattern of commodity movements influenced by increasing competition from other modes of transport as well as the changing patterns of economic activity in the area served by the N.A.R.. Attention will be devoted to the manner in which the railway has met the challenge from these other modes of competition.

3. <u>The 1970's</u>: The present decade reveals a change in the movement of revenue freight commodities. Grain was the most important <u>revenue freight</u> commodity, up to the mid 1960's, but by the early 1970's, it had fallen behind shipments of mineral ores, petroleum products, and lumber. In addition, the 1970's witness the final withdrawal of passenger services on all lines except for a weekly mixed freight and passenger service on the northeast line to Fort McMurray. This line has, since the 1970's, carried some phenomenal amounts of northbound revenue freight.

> The current decade witnesses the N.A.R.'s maturation from a railway to an important inter-modal* transport system serving Northern Alberta and the far North.

A brief survey of the freight rate structure has been included in the section on rail-road competition as this factor, together with the technical renovations of the railroad, the implementation of modern technology in its rolling stock and equipment and the initiation of some changes in railway operations have been instrumental not only in meeting the challenge of competition, but in rendering better transport facilities to the regions it serves and encouraging further economic development.

Though this study is concerned almost entirely with the movement of goods rather than people, rail passenger traffic warrants some mention in view of the current trend towards the withdrawal of passenger trains from service. Passenger traffic currently is of minor significance not only to the geography of the region, but to the Railway Administration as well, for the number of people using the rail services today are absolutely minimal.

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*Inter-modal: The co-ordinated services of rail and road transport. The integrated services of these two overland modes of transportation (and in some parts of the world, with water and air transport) portrays the best features of the service potential of each mode.

The concluding chapter of this study not only summarizes the role being played by the N.A.R. in the economic growth of the region it serves, but assesses some of its plans for the future. In addition, based on the in-depth study of this railway system, the author makes some comments and suggestions on future directions for this railroad. If the manner in which this railway has faced up to the increasing challenge of competition is any indication, then this does reveal a changing policy in railroad operations, triggered by a change in the philosophy of the N.A.R. management.

Throughout this study, maps, diagrams, and statistical data will be used as tools for analysis, and to facilitate mapping and interpretation of statistical data, the freight traffic will be classified as:

(a) "Outbound" or "Forwarded Traffic" - i.e., freight forwarded from points on the N.A.R. to be terminated at Edmonton or delivered to Canadian National and Canadian Pacific rail connections, and

(b) "Inbound" or "Received Traffic" - i.e., freight received from Canadian National and Canadian Pacific rail connections as well as from within the city of Edmonton, to be terminated at points on the railroad, as well as delivered to other connections such as the Great Slave Lake Railway.

Commodities moving on the N.A.R. have also been classified into five groups - viz: i) Products of Agriculture, ii) Animals and Animal Products, iii) Products of the Mines, iv) Products of Forests and v) Manufactures and Miscellaneous.

The rail net has been divided into eight traffic generating regions which correspond to the eight subdivisions of the N.A.R.. This division is conducive to a better understanding of the varying economic developments and structure across the region. The eight subdivisions are:

1. Lac La Biche - Carbondale to Lac La Biche; 165.8 km (113 m)
2. Waterways - Lac La Biche to Waterways; 279.4 km (172.4 km)
3. Barrhead - Busby to Barrhead; 41.9 km (26.1 m)
4. Peace River - Winagami to Hines Creek: 182.5 km (113.4 m)
5. Edmonton - Dunvegan Yards, Edmonton to Smith; 210.8 km (131 m)
6. Slave Lake - Smith to McLennan; 211 km (131.2 m)
7. Smoky - McLennan to Spirit River; 153 km (95 m)
8. Grande Prairie - Rycroft to Dawson Creek; 222.1 km (138 m)

The Regional Setting

The Northern Alberta Railways Company serves that part of Alberta generally referred to as "Northern Alberta"*, an extensive area extending north of Edmonton. Indirectly this railway serves the Northwest Territories as well, by linking up with the water routes to the Arctic Ocean (Kitto 1928, Mackintosh 1934), and with the Great Slave Lake Railway which was completed in 1964 (Figures 1.1 & 1.2). A brief survey of the physical geography and related patterns of economic acitivity, as well as the rail pattern in Northern Alberta is requisite to a better comprehension of the interaction of this railway with the stages of economic development in this region. Therefore, this section will focus on certain characteristics of the physical environment which are particularly relevant to agricultural activity, the pattern of settlement, and other economic activities which have the greatest pertinence to the developments and modern functions of this railway.

One of the most striking features of the region is the absence of major relief features over widespread areas. The

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*In this study, the designation "Northern Alberta" pertains to the approximately 336,700 sq. km. of territory in Alberta that extends from 54 N latitude to 60 N latitude and lies between the 110 W and 120 W meridans.

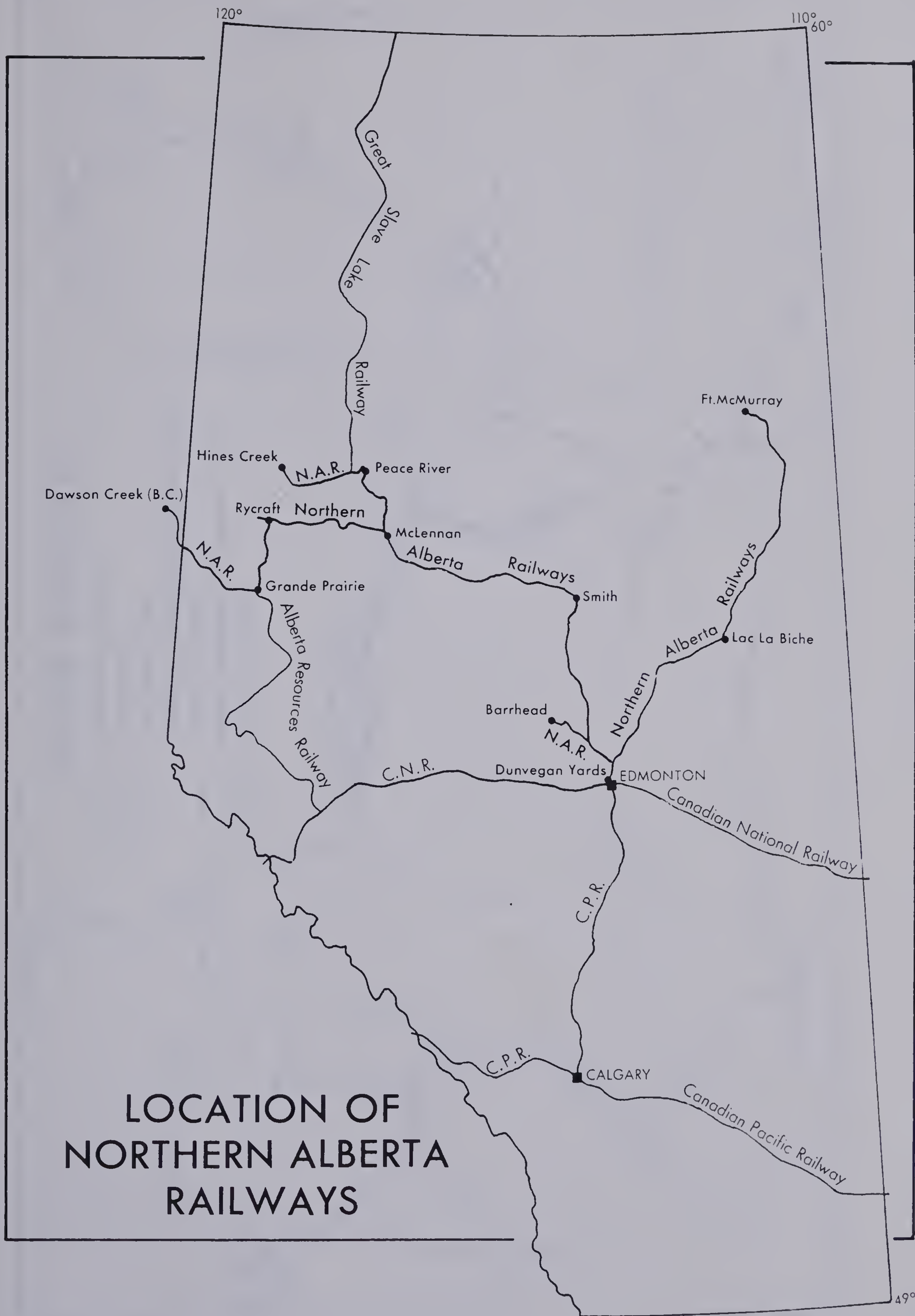
120°
110°
60°
49°
Great Slave Lake Railway
Hines Creek
N.A.R.
Peace River
Dawson Creek (B.C.)
Rycraft
Northern
McLennan
Alberta
Railways
N.A.R.
Grande Prairie
Smith
Ft.McMurray
Railways
Alberta
Lac La Biche
Northern
Alberta Resources Railway
Barrhead
N.A.R.
C.N.R.
Dunvegan Yards
EDMONTON
Canadian National Railway
C.P.R.
C.P.R.
CALGARY
Canadian Pacific Railway
LOCATION OF
NORTHERN ALBERTA
RAILWAYS

FIGURE 1.1

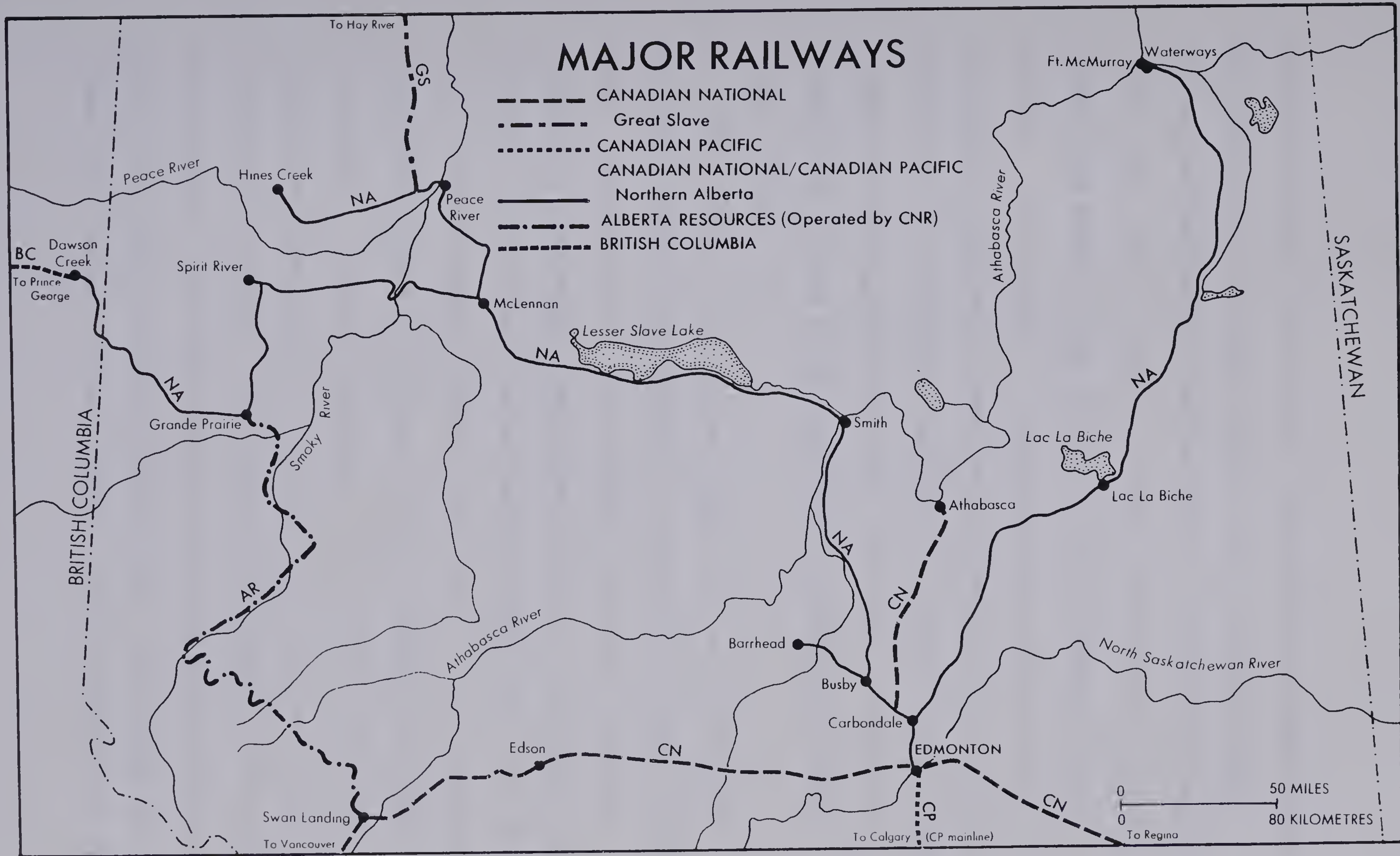
MAJOR RAILWAYS
CANADIAN NATIONAL
Great Slave
CANADIAN PACIFIC
CANADIAN NATIONAL/CANADIAN PACIFIC
Northern Alberta
ALBERTA RESOURCES (Operated by CNR)
BRITISH COLUMBIA
To Hay River
GS
Peace River
Hines Creek
NA
Peace River
BC
Dawson Creek
To Prince George
Spirit River
McLennan
Lesser Slave Lake
NA
NA
Grande Prairie
Smoky River
BRITISH COLUMBIA
AR
Athabasca River
Swan Landing
To Vancouver
Edson
CN
Ft. McMurray
Waterways
Athabasca River
NA
Smith
Lac La Biche
Lac La Biche
Athabasca
NA
CN
Barrhead
Busby
Carbondale
EDMONTON
North Saskatchewan River
CP
To Calgary
(CP mainline)
CN
To Regina
0
50 MILES
0
80 KILOMETRES
SASKATCHEWAN

FIGURE 1.2

drainage basins of the Peace and Athabasca River systems reflect the topography of the whole region, which is a vast plateau sloping northeastwardly from the foothills of the Rocky Mountains in the west, from an elevation of about 1000 metres to approximately 300 metres in the vicinity of Lake Athabasca in the northeast. The region is interspersed with uplands which rise 200 metres to 800 metres above the surrounding country, which is essentially the northernmost extension of the Great Central Plain of Western Canada (Mackintosh 1934, Kitto 1928). Consequently, there are no serious relief impediments to overland transportation. (Figure 1.3).

The climate of this region ranges from humid continental with cool summers near Edmonton, to a sub-arctic climate further north. While the entire area normally experiences relatively long severe winters and comparatively short growing seasons and adequate precipitation, the continental climate does offer variable daily and seasonal temperatures as well as wide (seasonal and annual) variations in precipitation. Average monthly mean temperatures in summer range between 15°C and 18°C, with lower temperatures prevailing in the uplands and in the more northerly sections of this region. Mean annual precipitation is under 600 mm everywhere, the average varying between 400 mm and 500 mm, with most of this falling during the warm season. The average growing season varies between 100 and 120 days with an average frost free

RELIEF PROFILE OF N.A.R. ROUTE BY SUBDIVISION

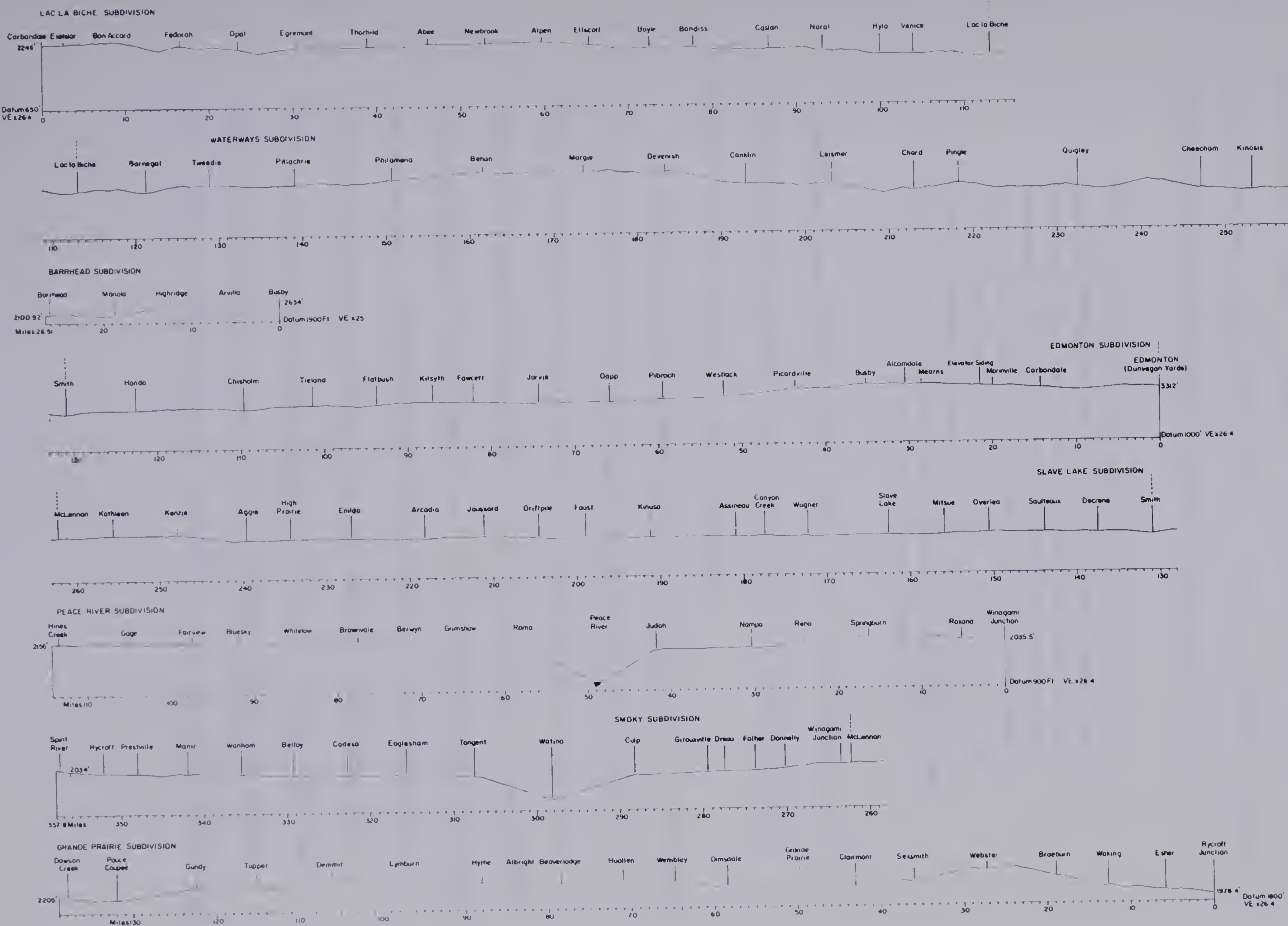

FIGURE 1.3

period of about 90 days in the southern and western parts of the area and about 75 to 80 days in the northern and eastern parts of this region. "Spring frosts are generally not dangerous to growing cereal crops as they are not 'killing frosts'; summer frosts are the real danger." (Dawson & Murchie 1934).

> "While averages have been mentioned here, it must be remembered that the agricultural settler does not live or plan by averages, annual or seasonal, but from day to day and from season to season. He is affected more by the departures from normal, than normal temperatures or rainfall conditions. It is the variability of climatic conditions that is more important than the average conditions." (Mackintosh 1934)

Despite these limitations, the climatic conditions make the area generally suitable for certain types of crops, notably: wheat, barley, rye, oats, and rape seed.

The characteristic vegetation of the region is mixed woodland and grassland interspersed with light forest cover of poplar and spruce, the 'prairies', so prominent in the place names of the region (Mackintosh 1934, Kitto 1928). The upland areas are heavily wooded and clearing for farming activities has been an expensive and time-consuming task. The government of Alberta has been advised by its soil experts that dark grey 'parkland' soils are sufficiently fertile to ensure very satisfactory crop returns and that the second class grey wooded soils "justify settlement and farming activities even though they

are considered to be marginal lands." (Alberta Soil Survey Report). On this basis, therefore, a total of nearly 6,070,500 hectares or 15 million acres are suitable for farming and settlement in the Peace River region, which is approximately 45% of the total available land in the Peace River Country. On the other hand, only a small amount of land is suitable for farming activities in the northeast sector of the region. North of this settlement, muskeg and third class soils dominate the area to and beyond Fort McMurray (Agriculture Report (801-1 C.D. 12) 1965). While detailed soil information for this area is not available as yet, a preliminary soil report (63-1) revealed that only 13% of the entire 12,141,000 hectares (30 million acres) in this northeastern sector was 'fairly suitable' for farming activities, and of this, only about 5% was good crop land.

From the location map of the N.A.R. (Figure 1.1), it should be observed that the railway system exhibits two markedly distinctive routes; a northwesterly line to the Peace region and a northeasterly line to Fort McMurray in the oil sands with both radiating from the central hub of Edmonton, the so-called "Gateway to the North". The geographic diversity in climate, vegetation, soils, and mineral resources has created two distinctive geographic regions found in the area, which reflects the specific adaptations to geographic differences (Dickinson 1947, Putnam 1952). It is this prevailing geographic diversity (which belies the general physical

uniformity of the region) that has given rise to different demands for transportation.

Though not necessarily the last agricultural frontier in Canada, the Peace River region was one of the largest single areas of active settlement in the nation during the 1920's. Early farming experiments by the fur traders and missionaries had demonstrated the agricultural potential of the Peace River Country (Dawson & Murchie 1934, Mackintosh 1934), but at that time there was little incentive to develop farming beyond local needs. The westward thrust of the transcontinental railway across the southern area of the Prairie Provinces in the 1880's initiated a rapid settlement process in the southern and central part of Alberta and thus, brought the Peace River region of Northern Alberta closer to national and world markets. The westward thrust of the population, however, veered away from the rugged foothills of the Rockies west of Edmonton and turned northward towards the valley of the Peace which lies beyond a three hundred kilometer barrier of forest and rough hilly land. Many settlers, some well-equipped, others ill-equipped, found their way to this agricultural frontier; some 'squatted' while others 'filed for land' and settled on the more fertile open lands which were ready for the plough (Mackintosh 1934).

These, however, were but beginnings which were slow in bearing fruit, for during these early years of experimental farming and isolated settlements, few products reached outside markets. Only

with an efficient form of transportation that would permit the export of grain, livestock, and lumber, was the growth of flourishing settlements possible. However, the stage was set for the next phase in the integration and growth of these isolated settlements which were ready to act vigorously when improved transportation became available. Consequently, one might justifiably state that the northwesterly line of the Northern Alberta Railways was constructed specifically to serve the Peace River Country in response to the demands of agriculture, which was and still is the most important activity in the area. The lumbering and mining potential of the region only served to augment the demand for this main line.

On the contrary, the northeast line to Fort McMurray did not engender any such demand. Agricultural prospects were poor in view of the unsatisfactory soil conditions, inadequate drainage and the vast expanses of muskeg, all of which combined to make the region north of Lac La Biche inhospitable to settlement and farming activities. At that time, the railway line was only a link with the great waterway route to the MacKenzie River system and it established Fort McMurray as a key transport centre on this route.

Moreover, the size and scope of the Athabasca Oil Sands (which covers more than 31,000 sq km in the region surrounding Fort McMurray and has since revealed an estimated potential of over 625 billon

barrels of synthetic crude) were not fully known. Nevertheless, acting on the following report of Dr. Sydney C. Ells, Department of Mines, Ottawa, the line was constructed as early commercial development of these Oil Sands was foreseen if a rail connection would be available:

> "The bituminous sands of Alberta outcrop at a large number of points along the Athabasca River and its tributaries for many miles north and south of Fort McMurray. Many of these outcrops represent portions of the deposit which should prove commercially valuable. It is hoped that the present hinderance to the development of the mineral resources of this northeastern district will be removed by the early completion of the railway now under construction to McMurray." (Ells 1916)

The high costs of constructing the line through many kilometres of muskeg and boggy marshlands generated much political controversy resulting in the resignation of the Premier of the province at that time (MacGregor 1972). Though the first technical study of the Oil Sands by the Federal Government had begun in 1875, under Professor John Macoun, it was only in 1967, that the first major extraction plant, constructed by Great Canadian Oil Sands Company (G.C.O.S.) went into operation, employing the 'hot water flotation' technique pioneered by Dr. Ells since 1913 and later perfected by Dr. Karl Clark of the Alberta Research Council. More recently, Syncrude Canada Ltd. has built a 129,000 barrels per day plant at Mildred Lake just north of Fort McMurray (Syncrude 1975).

This then was the situation at the turn of the century, the nuclear patches of settlement preparing the way for a more productive period. This was the starting point in the regional and economic development of Northern Alberta. The dawn of a new era was about to take place - an era of expansion and the integration of settlements. The most important single event in the development of this region was the entry of the railway (Mackintosh 1934).

PART ONE

1907 - 1949

CHAPTER TWO

THE EARLY DEVELOPMENT AND PERIOD OF DOMINANCE OF THE N.A.R. 1907-1949

The Evolution and Development of the Railway System 1907-1929

The charters authorizing the construction of the lines now comprising the Northern Alberta Railway system were granted after the turn of the 20th Century, the first being in 1907, which permitted the Edmonton, Dunvegan and British Columbia Railway Company (E.D. & B.C. Rly. Co.) to "build a standard gauge railway measuring 1.435 metres between the rails (4' 8 1/2") in a north-westerly direction from Edmonton to a point at or near Fort George, British Columbia." (Charter 1907, 6-7). The main purpose of this northwestern line was to serve the Peace River Block, a potentially important area of agricultural activity outside of the extensively settled southern and central Prairies.

The construction of this line commenced in 1912 with the route following one of the old "Klondike Gold Rush" trails running north from Edmonton to Smith and then westward via Slave Lake near Mirror Landing, through High Prairie about forty kilometres (25 miles) southwest of Grouard, reaching McLennan in the Peace Country in 1914. By 1916, the rails had been extended to Spirit

River 575.8 kilometres (357.8 miles) from Edmonton, but 40 kilometres (25 miles) short of Dunvegan and instead of continuing on to this pioneer settlement, the line was constructed southwards from Rycroft to Grande Prairie, 80 kilometres (50 miles) distant and was completed by late 1916 (Figure 2.1).

Meanwhile, a Provincial Charter in 1909, had granted the Alberta and Great Waterways Railway Company* (A & G.W. Rly. Co.) the authority to "construct a standard gauge railway line in a northeasterly direction from Edmonton to a point at or near Lac La Biche and thence, on to Waterways" (Charter 1909-9), an important river port at the junction of the Clearwater and Athabasca Rivers near Fort McMurray (Fort-of-the-Forks) in Northeast Alberta. This line was to provide a connection with the river boats which the Hudson's Bay Company operated at Peace River Crossing, Waterways and Fort Vermilion, thus providing a link to all points on the MacKenzie River. It was hoped that this rail line would encourage the development of the vast Athabasca Tar Sands in the vicinity of Fort McMurray (Ells 1916). However, disputes with the Provincial Government pertaining to costs of construction delayed the laying of track and the ensuing litigation (Royal Commission 1910) resulted in the original company handing over the building of the

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*For details pertaining to the incorporation of A. & G.W. Rly. Co., read the Report of the Royal Commission on this topic (1910).

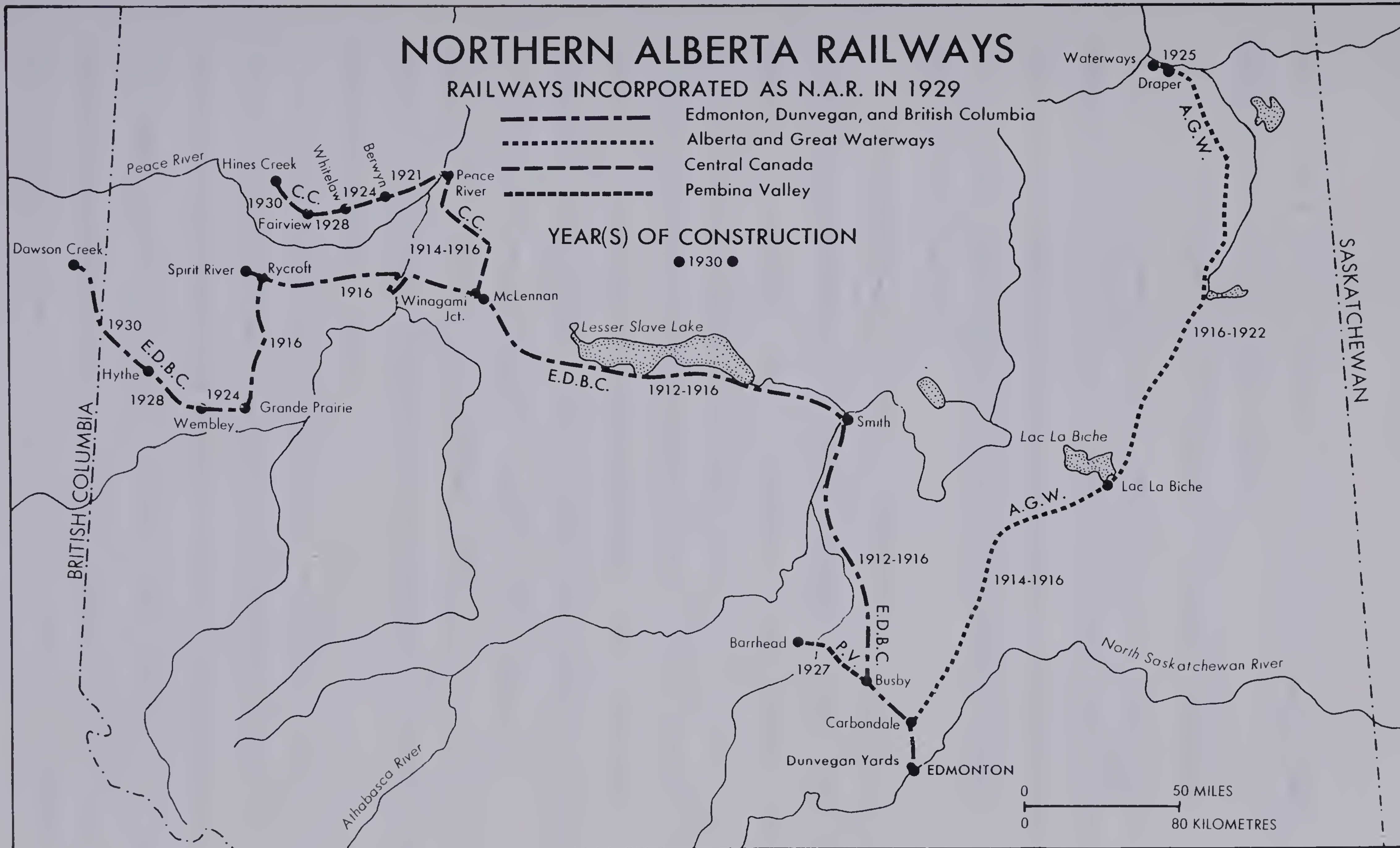
NORTHERN ALBERTA RAILWAYS
RAILWAYS INCORPORATED AS N.A.R. IN 1929
Edmonton, Dunvegan, and British Columbia
Alberta and Great Waterways
Central Canada
Pembina Valley
YEAR(S) OF CONSTRUCTION
1930
Waterways
1925
Draper
A.G.W.
Peace River
Hines Creek
Whitelaw
Berwyn
1921
1924
1930
C.C.
Fairview
1928
Peace River
C.C.
1914-1916
Dawson Creek
Spirit River
Rycroft
1916
Winagami Jct.
McLennan
1930
E.D.B.C.
1916
Hythe
1928
1924
Grande Prairie
Wembley
Lesser Slave Lake
E.D.B.C.
1912-1916
1916-1922
SASKATCHEWAN
Smith
Lac La Biche
Lac La Biche
A.G.W.
BRITISH COLUMBIA
1912-1916
1914-1916
E.D.B.C.
Barrhead
P.V.
1927
Busby
North Saskatchewan River
Carbondale
Athabasca River
Dunvegan Yards
EDMONTON
0
50 MILES
0
80 KILOMETRES

FIGURE 2.1

lines in 1913 to J. D. McArthur of Winnipeg, who was already constructing the E.D. & B.C. Railway.

The construction of the northeast route was commenced in 1914 from Carbondale, a point approximately 30 kms north of Edmonton on the E.D. & B.C. line and by mid 1916, the rails had reached Lac La Biche, one hundred eighty-two kilometres (113.9 miles) distant and were being pushed northeastwards towards Waterways (Figure 2.1).

In the meantime, the Central Canada Railway Company, which had been incorporated by a Provincial Statute in 1913, authorized Messrs. J. D. McArthur and Co., to build a line to Peace River Crossing (Charter 1913-4). Construction started in 1914 from Winagami Junction, a point 2 kms (1.3 miles) west of McLennan on the main line to Spirit River and by 1916, this section was completed to Peace River. Thus by 1916, the three major centres of the Peace River agricultural country - the last great agricultural frontier of the Western Canadian plains (Kitto 1918, 1928) - Spirit River, Grande Prairie and Peace River, had all been linked to Edmonton by rail.

As indicated, the construction of the Edmonton, Dunvegan and British Columbia Railway, the Central Canada Railway and the Alberta and Great Waterways Railway lines had been undertaken by J. D. McArthur of Winnipeg, who was assisted financially in these enterprises by the Province of Alberta which guaranteed the payment of capital. Under the terms of the Charters, the operation

of the railways by this enterpreneur was part of the agreement. However, his lack of experience in railway operations soon led to difficulties, as is evidenced in the following statement:

> "With little or no knowledge of railway management and operations, it was not long before J. D. McArthur and Co., was in grave financial difficulties, and as a result of operating losses sustained and its inability to meet the debenture charges, the Government of Alberta was obliged to intervene and take over the operation of these lines early in 1920." (N.A.R. Document p. 3)

After extensive efforts to work out a solution to the financial and operational problems presented by these three railway lines, the Provincial Government finally entered into an 'Operating Agreement' with the Canadian Pacific Railway (C.P.R.) in July 1920, by which the C.P.R. assumed the responsibility for the management and operations of the Edmonton, Dunvegan and British Columbia, and the Central Canada Railway lines only, for a period of five years, with the Government obligating itself to advance an additional two and one-half million dollars to eliminate the deferred maintenance costs of these lines. The Government was also obliged to assume the responsibility of operating the Alberta and Great Waterways line.

The Canadian Pacific Railway operated the Edmonton, Dunvegan and British Columbia line as well as the Central Canada line under this 'Operating Agreement' until the end of 1925. During this period, further extensions to the existing rail lines were laid.

In 1921, the Central Canada line was extended 37.0 km (23 miles) from Peace River to Berwyn and by 1924, an additional 21 kms (13.1 miles) had been laid to Whitelaw. In that same year, the Edmonton, Dunvegan and British Columbia line had also been extended by 24 km (15 miles) from Grande Prairie to Wembley. In 1922, work on the Alberta Great Waterways line, which had been progressing intermittently, was accelerated and the line was extended 270 km (168 miles) to Draper and completed to its terminus at Waterways by November 1925.

After the expiry of the 'Operating Agreement' with the Canadian Pacific Railway in 1925, the Provincial Government resumed negotiations with the Canadian National Railways and the Canadian Pacific Railways in an effort to have either of these railway companies purchase the entire properties. Both companies were reluctant to do this as each of them was aware that it would be inheriting the heavy debts already incurred by these three lines. However, both were quite prepared to enter into operating agreements only. In the meantime, the operating agreement with the Canadian Pacific Railway had been renewed, subject to three months notice of termination by either party, but now, having failed to sell the properties, the Provincial Government decided to take over the operation of the lines. Accordingly, it took up the 'option to purchase' of the capital stock, terminated the operating agreement with the Canadian Pacific Railway and commenced operating all the lines on November 11, 1926.

It was during this period of public ownership of these railway lines that the Government, authorized by a statute in late 1926 (Charter 1926, 16-17), constructed the Pembina Valley Railway from Busby, a hamlet 56.6 km (35.2 miles) from Edmonton on the Edmonton, Dunvegan line, northwest to Barrhead, completing the 42.6 km (26.5 miles) railway line to Barrhead by October 1927. In 1928, the Government extended the Central Canada line from Whitelaw by 22.5 km (14 miles) to Fairview and the Edmonton, Dunvegan line from Wembley by 38.6 kms (24 miles) to Hythe (Figure 2.1, p. 28).

It was probable that poor management had been eating into the profits of the railways before 1920 and had precipitated the financial difficulties encountered by J. D. McArthur and Co.. There is little doubt that the Canadian Pacific Railway Company had infused some efficiency into operating techniques and management of railway revenues during their brief stewardship of these lines from 1920 to 1926. Furthermore, having cured many of the ailments which had persisted during the McArthur period, the C.P.R. envisioned brighter prospects for these routes. Consequently, in 1928, "this Railway Company proposed to purchase the entire properties from the Provincial Government contingent on the Canadian National Railway participating on a fifty per cent basis." (N.A.R. Official Documents). This offer was accepted and early in 1929, an

agreement was finally concluded between the Provincial Government* and both the Canadian National and the Canadian Pacific Railway Companies, whereby:

> "these companies jointly purchased the entire properties for fifteen million five hundred and eighty thousand dollars, the purchasers assuming the responsibility for the guaranteed bonds of the separate railway companies, other than bonds to the extent of $7,400,000 due, and the total payable on January 1, 1959." (Bill 71, May 15, 1929)

A separate railway company under joint ownership was formed and incorporated as the Northern Alberta Railways Company on January 29, 1929, with its head office located in Edmonton. On June 14 of that year, the new company was incorporated by an act of the Federal Parliament. In 1930, the final extensions from Hythe to Dawson Creek, B.C. and from Fairview to Hines Creek were completed.

At this juncture, it is appropriate to emphasize that all these various lines were built to open up the farmlands of the Peace River Country, to move the lumber resources from the Grande Prairie, Lesser Slave Lake, and Swan Hills regions, to aid in the development of the Tar Sands at Fort McMurray and to connect with

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*While the sale was generally regarded as satisfactory, the Government of Alberta was left with a heavy loss as a result of the guarantees it had given, viz:

Capital Loss	$10,881,323.55
Income Loss	$10,768,330.33
Total Loss	$21,649,653.88

In addition, the accruing interest on the amounts guaranteed constituted an additional loss.

the river boats at Peace River Crossing and Waterways which the Hudson's Bay Company operated between Hudson Hope, B.C. and Fort Vermilion and points on the MacKenzie River. Traffic consisting mainly of grain, lumber, and livestock was fairly heavy and the volume of revenue traffic on the lines was increasing (Tables 2.1, 2.2).

The Era of Railway Dominance: 1930-1949

One of the most important events in the development of Northern Alberta was the construction of the railway, for prior to this event, settlements and farming activities had languished mainly because railways were lacking (Mackintosh 1934). Population clustered around the important fur trading posts and missions -- Fort-of-the-Forks (Waterways- Fort McMurray), Lac La Biche, Mirror Landing (Slave Lake), Grouard, Dunvegan and Peace River Crossing - Shaftsbury Settlement (Peace River). From the time the first charters authorized the building of the railways to the actual commencement of construction of the lines, settlements consisting of small clusters of population sprang up, in most instances, long before the railway lines reached them. People were settling where it was anticipated the lines would be laid. The rush for land was on and while wheat farming, livestock raising, and lumbering became profitable enterprises, windfall profits from land speculation was also a settlement motivation.

TABLE 2.1

ANNUAL REVENUE FREIGHT 1917 - 1929 IN TONNES

	Originating	Received	Total
1917	1003	7229	8232
1918	3357	10017	13374
1919	4646	7119	11765
1920	11152	12114	23266
1921	17541	19728	37269
1922	142393	39288	181681
1923	189969	32458	222427
1924	314626	49395	264021
1925	248746	33603	282349
1926	234271	54365	288636
1927	266607	91046	357653
1928	278075	156851	434926
1929 (January to June)	126709	63022	189731

SOURCE: N.A.R. Records

TABLE 2.2

VOLUME OF TRAFFIC IN TONNES BY COMMODITY CLASSIFICATION

	Products of Agriculture	Products of Animals	Products of Mines	Products of Forests	Products of Manufacture
1917	1291	451	462	2877	3151
1918	4178	1283	1301	936	5676
1919	4616	1976	841	611	3721
1920	10937	1770	2251	1271	7037
1921	3874	938	2261	8852	21344
1922	77852	11299	12848	61715	18331
1923	68829	10854	30763	94898	17083
1924	101665	12564	106255	112832	30705
1925	103944	13690	80967	61851	21897
1926	131698	8353	54513	60435	33637
1927	222315	9498	55192	31027	40621
1928	269429	9738	38808	45649	71302
1929 (January to June)	104899	3472	16884	31366	33110

SOURCE: N.A.R. Records

With the advent of the railway, shipping towns sprouted, strung along the railroad like beads on a string. The "end of steel" towns experienced their temporary "boom days", and when the railway lines crept on towards their ultimate destination, they lapsed into the status of the other small towns along the line. The inhabitants of this region, particularly those in the vast farming area of the Peace River Country, like the inhabitants of other inland plains, were dependent on railways since their agricultural system relied on railways and a complementary road network. As Bowman stated, "It is only in the simple society that life in the modern world can be maintained at great distances from the railway and road." (Bowman 1931). From the point of view of the farmer, the railway close at hand was always desirable, since the costs of hauling by wagon to the grain elevator were cut down quite substantially. The general conclusion based on studies made by the C.N.R., seems to be, "that the practical limit for hauling grain to the railroad is in the vicinity of ten miles."* The following series of maps (Figure 2.2, Mackintosh 1934) seems to support the empirical conclusion that it is economical for the railways to bring all productive areas in the region to within fifteen kilometres (10 miles) of its lines. Consequently, specialized wheat growing areas seem to have developed within fifteen kilometres of the railroad. This

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*S. W. Fayerweather, Bureau of Economics, Canadian National Railways (1930)

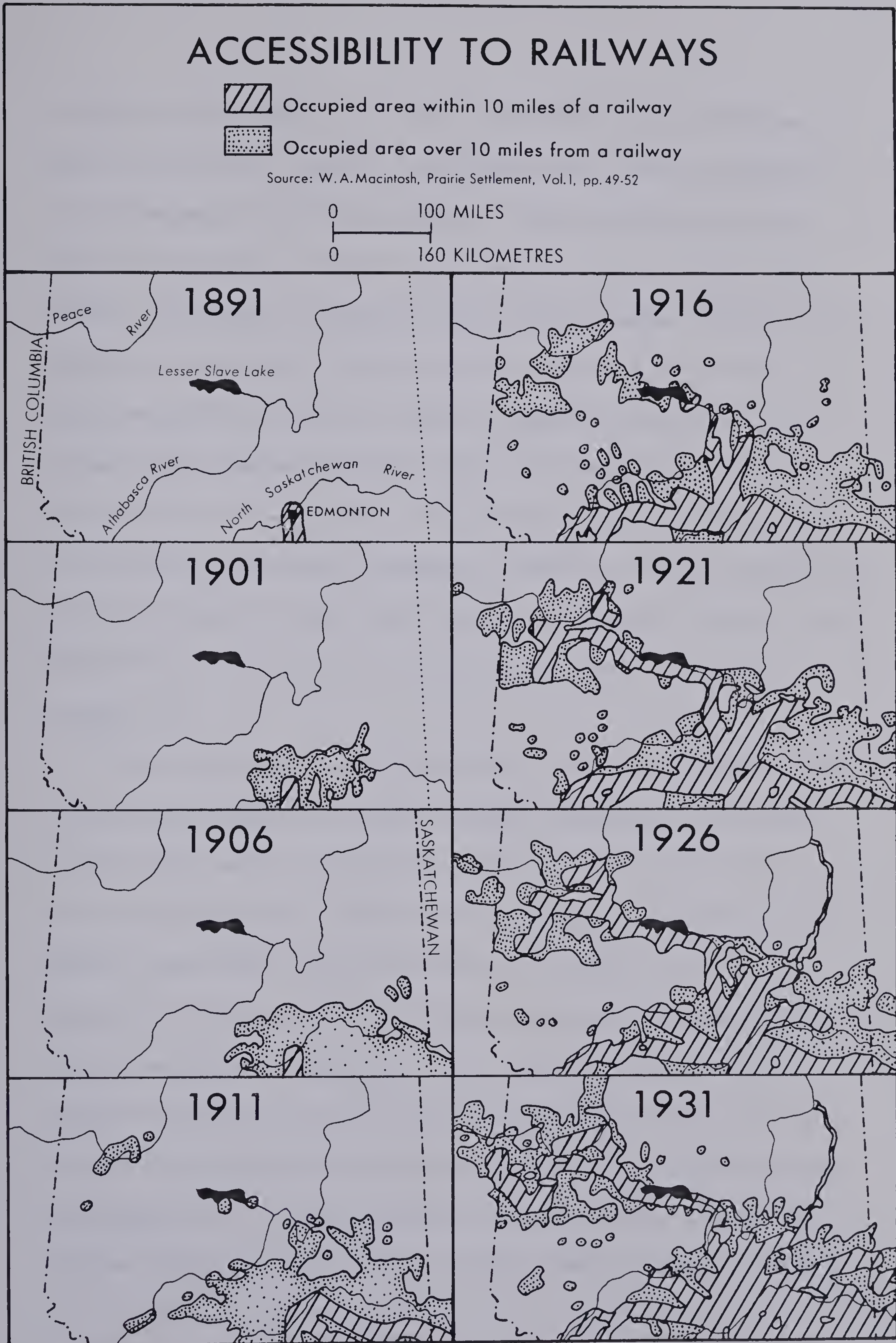

ACCESSIBILITY TO RAILWAYS
Occupied area within 10 miles of a railway
Occupied area over 10 miles from a railway
Source: W. A. Macintosh, Prairie Settlement, Vol. 1, pp. 49-52
0 100 MILES
0 160 KILOMETRES
1891
Peace River
Lesser Slave Lake
BRITISH COLUMBIA
Athabasca River
North Saskatchewan River
EDMONTON
1901
1906
SASKATCHEWAN
1911
1916
1921
1926
1931

FIGURE 2.2

'ribbon of settlement' on either side of the line constituted a belt of relatively intensive cultivation and land use which may be considered as the 'Railway Zone'. The importance of being within this 'zone' or 'belt' was clearly illustrated when many farming settlements - Berwyn, Bluesky, Beaverlodge, Fairview, and Wembley to name a few - which had been by-passed by the rail route, moved their entire villages to selected points on the railway line (Dawson & Murchie 1934). To these pioneer communities, the railway, with its unfailing accompaniments of two or three grain elevators, stockyard, loading platforms, banks, post office and general store, meant growth and progress and they firmly believed that they would now be carried forward on a wave of prosperity.

With increasing distance (between 15 km and 25 km) from the railway zone, specialized wheat farming disappeared, giving way to feed crops such as oats, barley, hay, alfalfa, and clover, with only 20% to 30% of the land being devoted to wheat and with much of these crops being converted to livestock. Closer analysis of these extensions of the ecumene has revealed a well-defined sequence of gradation in land use, and in particular, changes in both the type and areal proportion of crops cultivated as the distance from the railway increased. This same phenomenon was encountered in other regions by Monbeig (1952), Nicolai and Jacques (1954), Lovering (1963), Ehlers (1965), and Brown (1971).

The process of expansion and integration of settlements was an uneven process with a large exodus of men from the region for service during World War I and a greater immigration wave shortly after, which was followed by the depression beginning in the late 1920's. The Peace River region was essentially a farming area and the most important commodities at the time were grain, lumber, and livestock. Consequently, with falling wheat prices in the world market, high freight rates on these commodities and promised rail extensions not forthcoming, many settlers departed. While these events appeared to be a setback, they did encourage positive developments in the region. They taught farmers to diversify farming activities; they drove out the 'suitcase homesteader' and 'farm prospector'; they forced out the footloose adventurers and the unscrupulous profit seeking land grabbers for whom homesteads were to be sold for a profit; and they encouraged lower freight rates, thus enabling the region to compete more favourably with the settlements near Edmonton (Mackintosh 1934, Dawson and Murchie 1934).

Furthermore, although this phasing out of the unassimilable elements reduced the population in the region, it did not necessarily mean a reduction in farm production (Dawson & Murchie 1934). Many smaller poorly-managed homesteads came under the management, either by rent or outright purchase, of skillful and competent farmers. Closely related to these trends in increased productivity and in the composition of the population, was the

trend towards the emergence of dominant regional centers which was achieved by the occupancy of intervening farmlands, the development of social organizations centered around the railway town, the extensions of rail lines to their present terminals, the construction of an excellent system of roads and highways parallel to the railroad, and the initiation of telephone and telegraph facilities. Grande Prairie and Peace River, and to a lesser extent, Barrhead, High Prairie, Slave Lake, and Westlock in the agricultural-lumbering sector of the northwest, became such centres of regional centralization.

Period of Consolidation

As newer farming areas were being opened up, settled, and developed and grain and lumber shipments were steadily increasing, it had become quite apparent that the light steel (30 kg to the metre - 60 lbs to the yard) of this single track railway was inadequate to cope with the increasing volume of traffic as well as with the tractive forces exerted by the heavier and more powerful steam locomotives hauling the increased train loads. Consequently, a top priority programme initiated in 1930 by the newly formed railway company, was a rail relaying project combined with a simultaneous upgrading of the road bed. This resulted in the main line from Edmonton to Dawson Creek being relaid with 40 kg and 45 kg to the metre rails (85 lbs and 100 lbs to the yard), the heavier 45 kg rail being mandatory in

sections where the gradients were steeper than 1 in 100 and curvatures slightly in excess of 13° ;for example, the Watino section.

After the attack on Pearl Harbour, during World War II, this railway suddenly acquired strategic importance. Early in 1942, the commencement of the Alaska Highway and Canol projects changed the category of this railway from that of a pioneer road to an important defence link. (In 1942 and 1943, special passenger trains were put into operation to move American troops and personnel, in addition to the regular daily schedule). With this change, traffic increased tremendously from a 'twice daily' freight service and a 'tri-weekly' passenger service to a 'four freight trains a day' service and a daily passenger service schedule. For example, as of March 1, 1942, sixteen locomotives were sufficient to handle the bi-weekly passenger trains to Dawson Creek and Hines Creek, the 'mixed bi-weekly' service to Lac La Biche and Barrhead and the weekly service to Waterways and all freight services. By January 1, 1943, freight and passenger services had increased to the point where the services of forty-one locomotives were required to handle the increased schedule. The phenomenal increase in the volume of traffic moving on the N.A.R. lines during this period is evidenced in Figure 2.3 and Table 2.3. Volume of revenue traffic surged from 649,332 tonnes in 1941 to 1,177,158.6 tonnes in 1943 and by 1948, had nearly tripled from the volume moved in 1930.

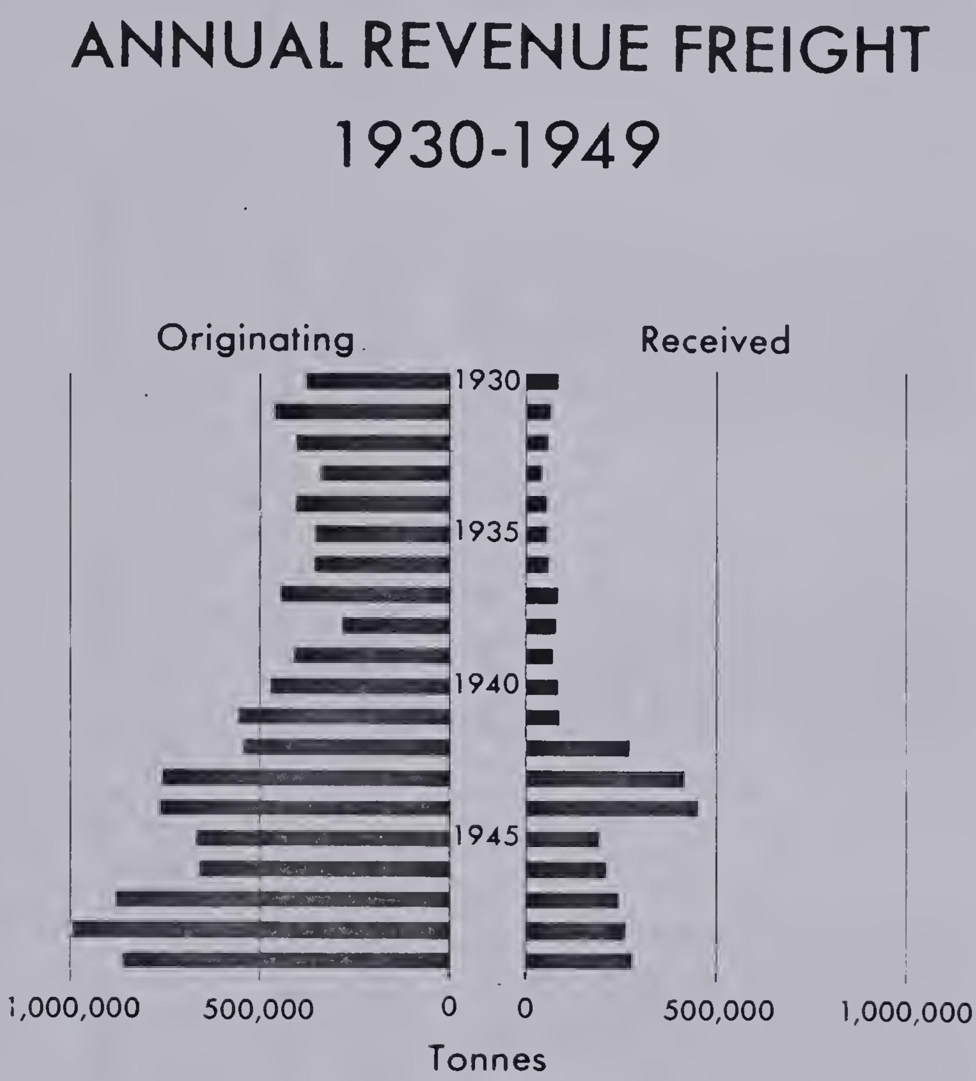

ANNUAL REVENUE FREIGHT
1930-1949
Originating
Received
1930
1935
1940
1945
1,000,000
500,000
0
0
500,000
1,000,000
Tonnes

FIGURE 2.3

TABLE 2.3

VOLUME OF TRAFFIC IN TONNES BY COMMODITY CLASSIFICATION
1930 - 1949

	Products of Agriculture	Products of Animals	Products of Mines	Products of Forests	Products of Manufacture
1930	307858.5	6623.1	51209.1	35986.5	68162.4
1932	375549.3	7146.9	31755.6	21106.8	37112.4
1934	385629.3	9059.4	29261.7	22770.9	44100.9
1937	352693.8	18833.4	58900.5	34971.3	69763.5
1940	379474.2	15757.2	35979.3	59617.8	67446.9
1941	427017.6	19885.5	46255.5	84194.1	71979.3
1942	387773.1	31516.2	77724.9	91653.3	233802.0
1943	229412.7	44740.8	328684.5	124906.5	449414.1
1944	486451.8	44796.6	297436.5	91593.0	290506.5
1947	512881.2	17491.5	183860.9	191097.0	215028.0
1948	581735.7	18673.2	132538.5	282632.4	236136.6
1949	543229.2	15471.0	123935.4	217739.7	241881.3

SOURCE: N.A.R. Records

With this upsurge in freight traffic, train loads and train lengths were increasing thereby necessitating the construction of additional and much longer sidings and spurs. Bridges, ballast, embankments and drainage facilities also had to be improved, while larger cooling plants and much better water and fuel supplies had to be installed. Furthermore, there was a shortage of labour, and extra manpower had to be secured at a time when this was extremely difficult to obtain. The 'parent' lines came to the rescue, however, and assisted with trained personnel, locomotives, equipment, and money.

This period from 1930 to 1949 was without doubt, the era of dominance by the railway. The N.A.R. dominated the transportation scene and the spectacular growth of freight traffic as well as passenger movement is evidence of this. It is all the more impressive when one realizes that the northeast line to Fort McMurray generated little or no traffic and that the mineral resources at Pine Point and Yellowknife had not been tapped as yet. While there appears to be no satisfactory technique for measuring precisely the extent of the contribution of the N.A.R. to the development of Northern Alberta, the fact remains that it was instrumental in advancing new economic development over most of the region, particularly, the Peace River area. This was clearly demonstrated by the increases in

land settlement, agricultural and lumbering activities and service industries since the N.A.R. was built and extended into the northwest part of Northern Alberta.

PART TWO

1950 - 1978

CHAPTER THREE

THE ERA OF COMPETITION BETWEEN ROAD AND RAIL

Introduction

Although motor vehicles were first used in this area in 1912, for the decades up to 1930 trucks served a function complementary to that of the railway. The farmer's first priority was a vehicle with which he could haul his grains to the nearest grain elevator and not surprisingly the first widespread use of trucks was in agriculture. With more trucks becoming readily available, particularly after World War I, the demand for improved roads became insistent, and as stated earlier the provincial and municipal governments spent considerable sums of money building new roads and improving the existing ones. This led to farm settlements being developed at greater distances from the railhead. By 1925, trucks were carrying quantities of grain from longer distances - as much as 100 km - to the nearest railway point (Mackintosh 1934). The rudimentary road network of this era contributed substantially to the development of the area by complementing the services of the railway not only in shipping out the produce of the region to national and international markets, but in moving in machinery and equipment for farming, lumbering, and

mining as well as food, clothing, supplies, and settlers effects for the general population.

By 1930, however, the beginnings of a shift in the role of trucking was evident. Trucks, which earlier had complemented the freight services of the railway were now emerging as competitors. Consequently, competition from trucking forced the N.A.R. to cut its rates on some of the commodities it handled, chiefly livestock, manufactured goods, and food and clothing (Dawson & Murchie 1934). The advent of World War II retarded the growth of trucking operations due to wartime restrictions on the supply of fuel and automotive accessories and the unavailability of motor vehicles and manpower, as all of these were chanelled into the war effort. However, the main arterial roads in the region were maintained and further developed because of the movement of troops and war supplies to the newly constructed Alaska Highway in 1942. With the cessation of hostilities in 1945 and the availability of surplus army trucks and abundant fuel supplies by 1948, the highway carriers began once again to erode the dominance of rail transport. By 1950, there were close to 1000 privately owned trucks and approximately 3750 commercial trucks and tractor-trailers registered in Northern Alberta (Table 3.1).

TABLE 3.1

NUMBER OF TRUCKS AND COMMERCIAL MOTOR VEHICLES
REGISTERED IN THE PEACE RIVER REGION - CENSUS DIVISION 15
1946 - 1956

Years	Trucks	Commercial Trucks & Tractor Trailers
1946	991	3630
1956	5455	9702

SOURCE: Unpublished Data, Alberta Bureau of Statistics

The protracted railway strike in 1950 was an opportune occasion for the trucking firms to capture traffic from the railway and to demonstrate the speed, versatility, and service potential of road transport.

It is obvious from the preceding discussion that the early roads developed as an essential requirement for effective railway service - a complementary function to the N.A.R.. This function has in no way diminished, for good roads directly affect the role and effectiveness of the railway. In general, 'pure' rail transport is the exception rather than the rule; it does occur, for example, when minerals are moved directly from the mines via unit trains to a sea for export, as is the case of coal shipped from the Grande Cache region by unit trains on the Alberta Resources Railway to the terminals in North Vancouver, B.C.. However, in most other cases, the normal sequence encompasses road transport before and after movement by rail, thereby illustrating the complementary

nature of rail and road transport systems. Without an adequate supply of good road linkages, no railway can collect by itself, enough freight to render itself an economically viable operation. Nor can trucks on the finest all-weather roads and highways move timber, grain, and mineral ores in bulk over long distances against rail or water competition. However, with the development of good all-weather highways, this complementary relationship of rail and truck rapidly evolved into a competitive relationship whereby the two modes became contenders for much traffic.

Development of Roads and Highways in Northern Alberta

In the days prior to the construction of the present Northern Alberta Railway system, the only 'roads' in existence in the Peace River region were the trails used by the "Klondikers", one north of Edmonton via Lesser Slave Lake and thence, westward and northwestward; the other, the Edmonton route north to Grande Prairie. The advent of the railway in 1912 and the ensuing rush to settle as close to the projected route as possible, resulted in a pattern of settlement extending not more than 16 km from the nearest railway point. This meant that the initial roads were 'feeders' to the railway and did not extend more than 16 km on either side of the railroad. They were merely rough trails created by the farming communities themselves, to enable them to take their grain to the railway station for bulk loading, while livestock were walked to the

railway stockyards. This was the pattern and function of the early roads in the region. The main road outlet was the Slave Lake-Grouard trail which was impassable in many sections due to the unstable roadbed, and this route as well as the feeder roads were veritable quagmires during the rainy seasons (Willis 1965).

By 1930, many sections of this road as well as the access roads were graded and improved, and within the next decade, the main arterial route to Peace River and Grande Prairie, the present Highway 2 North, was considerably improved and gravelled in many sections. The main stimulus to road development in the area occurred, however, during World War II, when the 2450 km long Alaska Highway was planned and constructed within nine months during 1942 by the United States Government. This dramatic achievement was an impetus to upgrading the Slave Lake-Grouard road, which immediately became a vital link to the Alaska Highway. In the ensuing years, most of the roads in the area were gravelled while the main arterial highways were paved in sections.

By 1969, the Provincial Government had provided Northern Alberta with a good road network by building heavy duty (25,500 kg and 32,660 kg standard) paved highways and a network of improved interconnecting roads between all important centres in the region. The stages of development in the highway and road network are shown in the accompanying maps (Figures 3.1 through 3.6). The construction of additional paved class one highways,

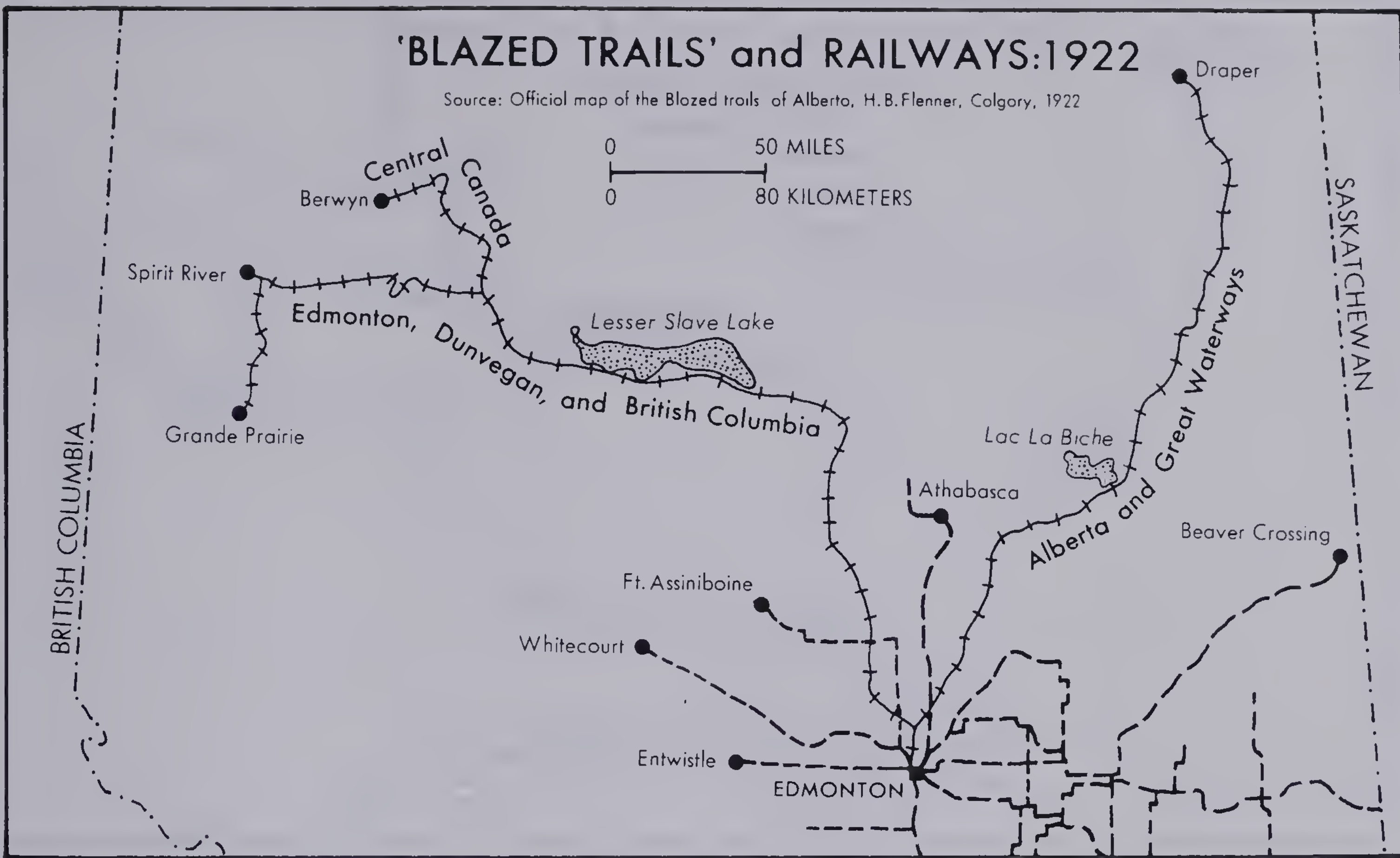


FIGURE 3.1

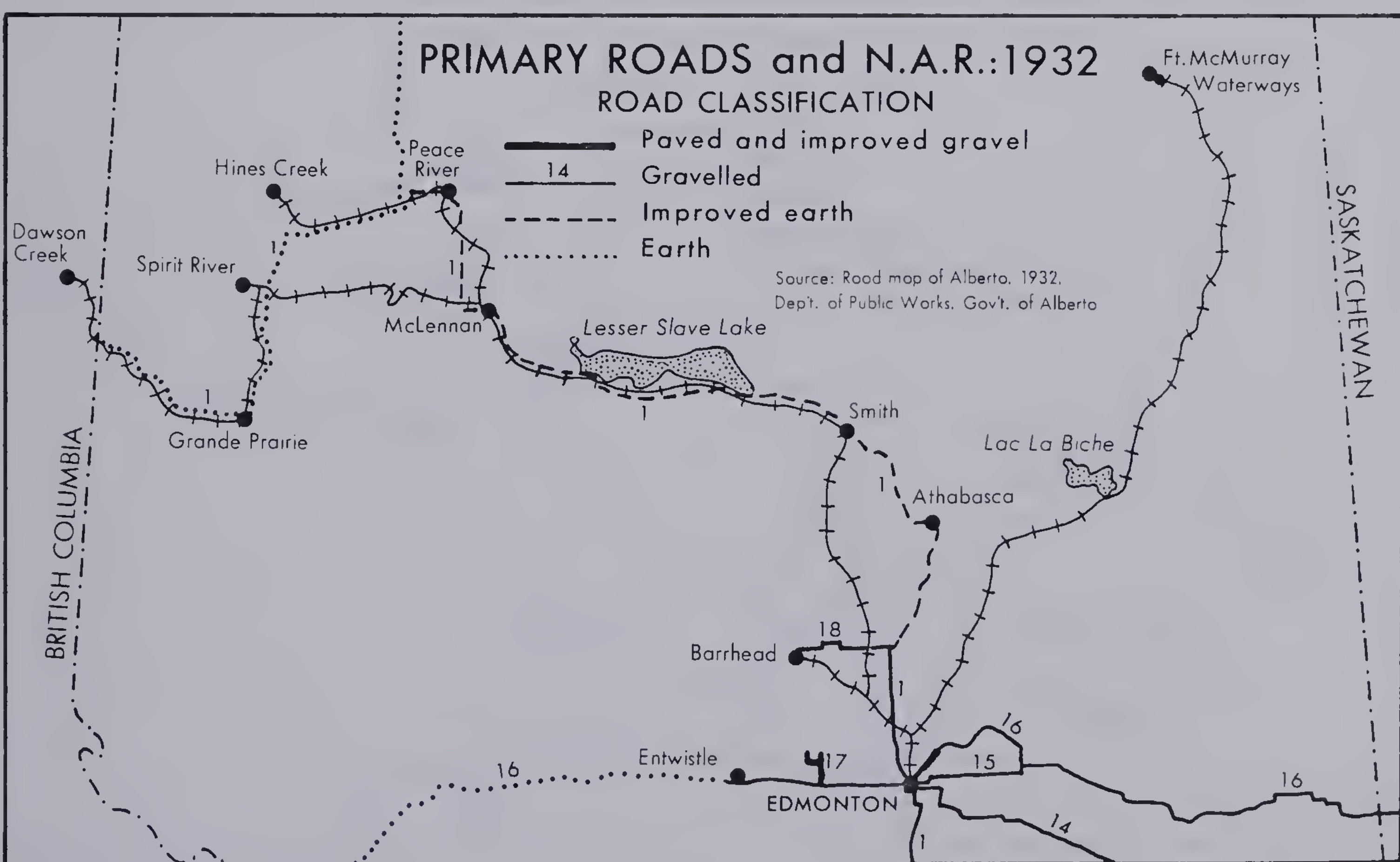


FIGURE 3.2

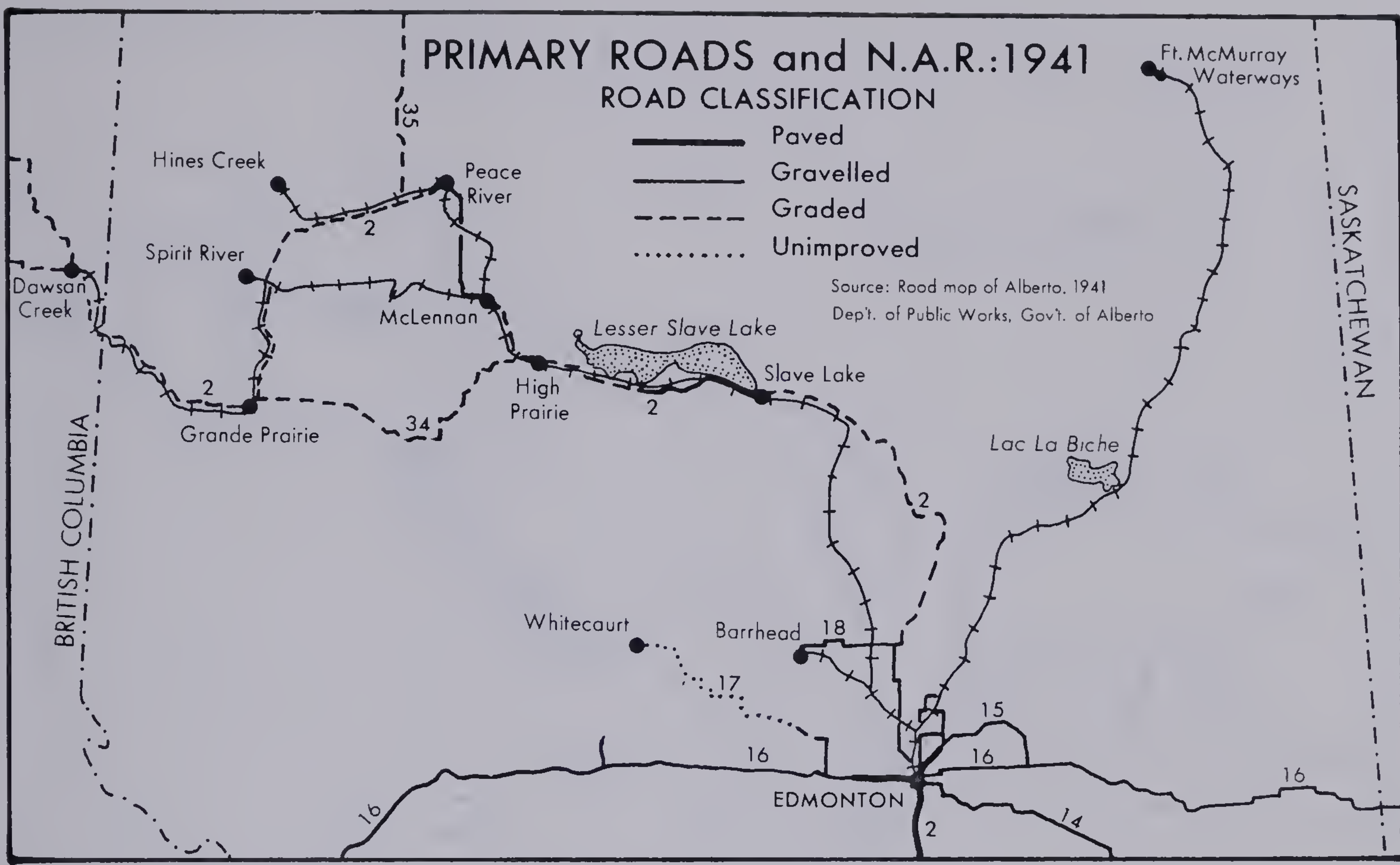


FIGURE 3.3

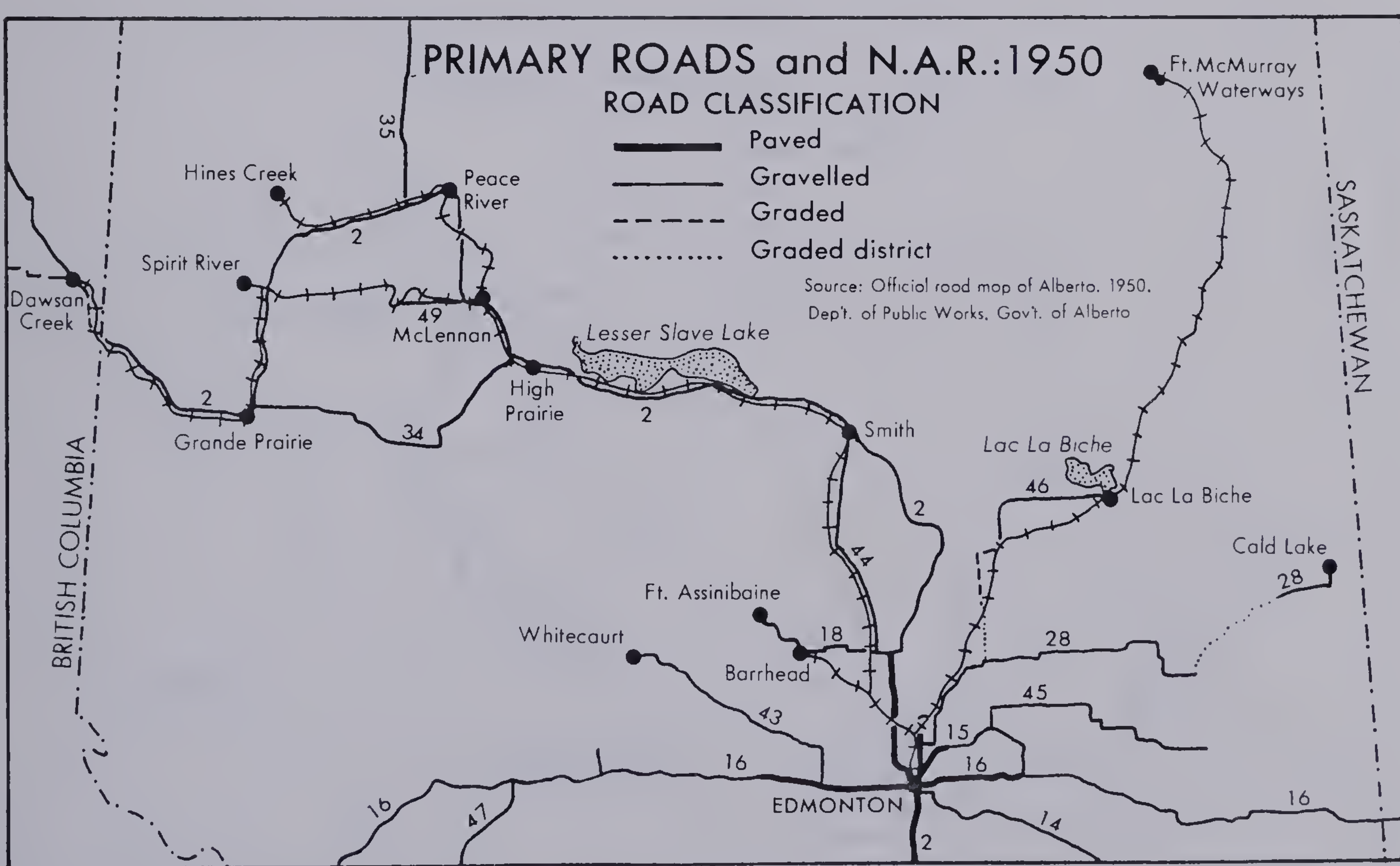


FIGURE 3.4

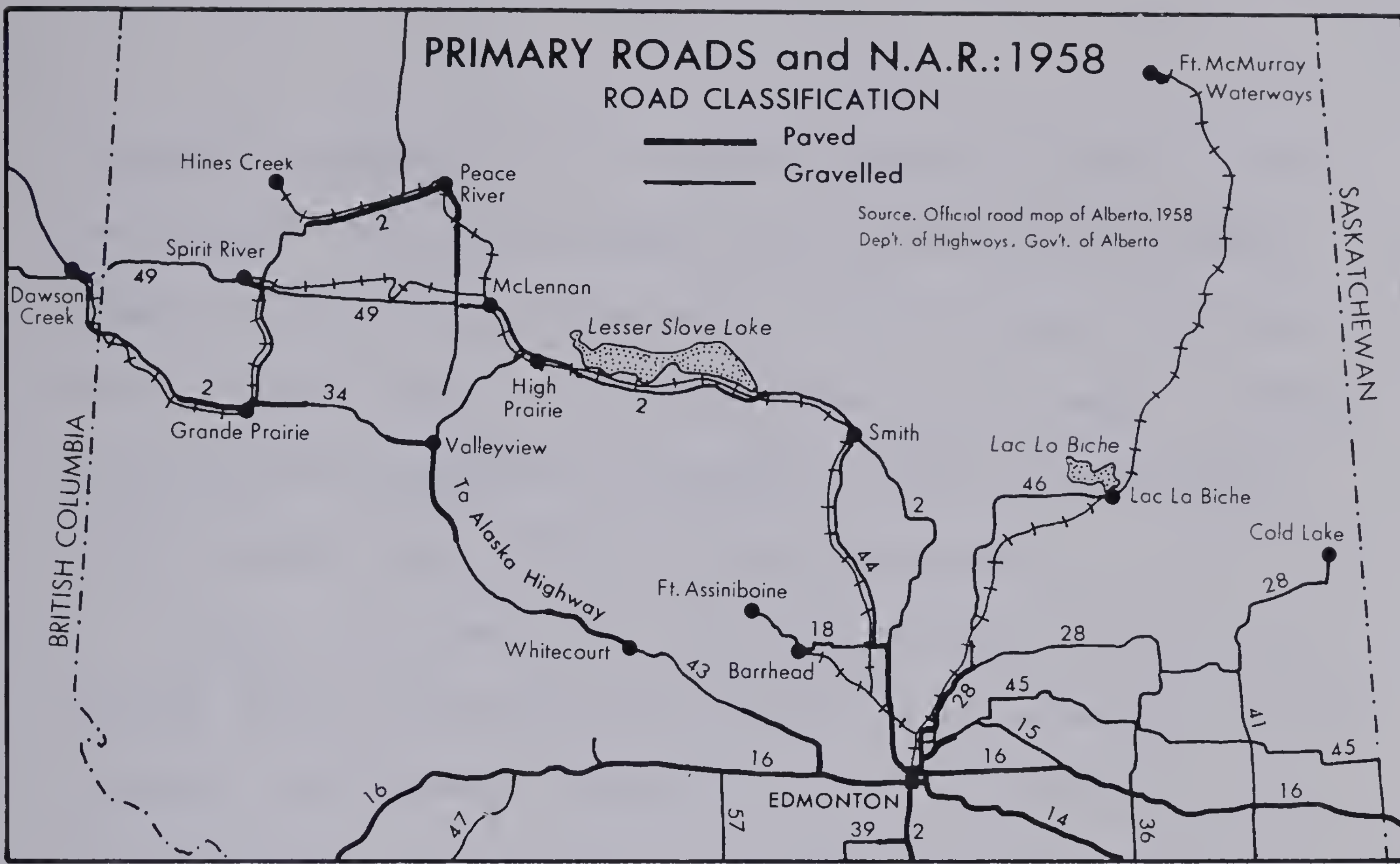


FIGURE 3.5

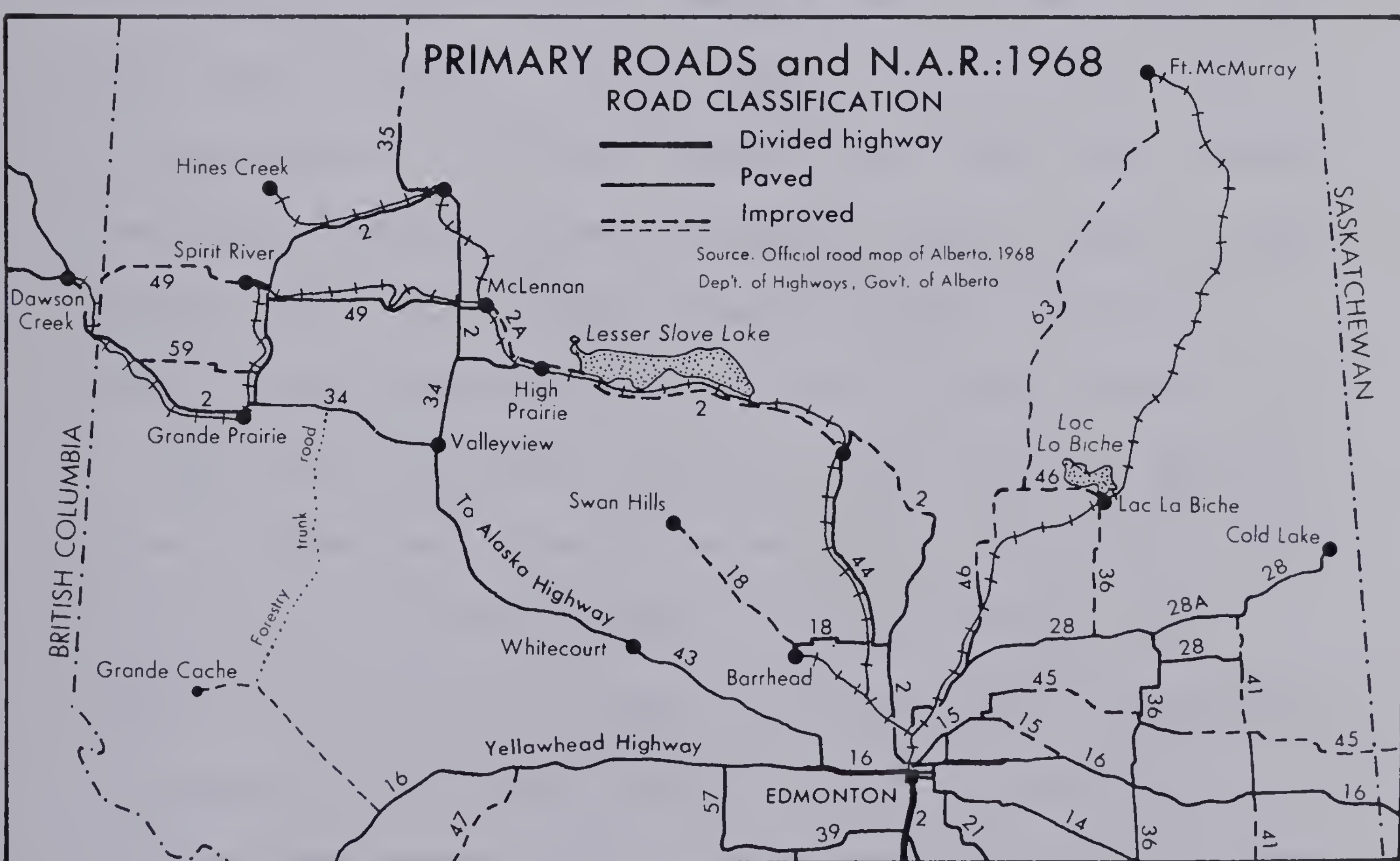


FIGURE 3.6

secondary highways, and the paving of gravelled highways is still continuing. This has encouraged new settlements and the development of the outlying fringe areas. Most local municipalities have also been active in providing better market roads. In 1969, the Provincial Government had graded 718 miles of market roads into homestead areas, 318 of which were gravelled.

Access to all main points in the Peace River District and through them to points west and north is by two paved all-weather highways from Edmonton. Highway No. 2 is the old Klondike Trail of the pioneers and the early fur traders. It runs north from Edmonton to the east end of the Lesser Slave Lake, through Slave Lake town and along the south shore of the lake, and enters the Peace area at Joussard. It continues on through High Prairie joining Highway No. 34 from Valleyview, then runs north to Peace River town. From Peace River this highway continues west through Grimshaw, Fairview, and south through Dunvegan, Rycroft and Grande Prairie, and thence northwestwards to Dawson Creek, B.C..

The other main highway is No. 43 which originates about 50 km west of Edmonton on the Yellowhead Highway No. 16 West, runs northwestward through Whitecourt and enters the Peace River region at Valleyview. From here the highway forks: Highway No. 34 runs north to link with Highway No. 2 west of High Prairie, while the other branch of No. 34 veers west to link with Highway No. 2 at Grande Prairie. An interconnecting Highway No. 49 runs west from Highway No. 2 at Donnelly Corner, through some

excellent farming regions, through Rycroft and Spirit River to Dawson Creek, B.C.. All of these paved highways converge on Dawson Creek, B.C. to link with the Alaska Highway which originates from that city.

Another important highway is No. 35 North, an all-weather road, part paved, part gravelled. Better known as the MacKenzie Highway, it originates from Highway No. 2 at Grimshaw and links Yellowknife in the N.W.T. via the settlements of Manning, Battle River, High Level, and Hay River.

The main road artery in the northeast section is Highway No. 63 which emerges from a maze of secondary paved roads and Highways 28 and 46 to eventually become the link between Edmonton and Fort McMurray. The accompanying map shows the location of the road network and principal highways serving Northern Alberta (Figure 3.7).

In summary, the development of modern road networks in Northern Alberta influenced settlement patterns and provided an underlying stimulus to the expansion of the trucking industry. The end of World War II had ushered into the Peace River region a new and significant phase of development which resulted in a number of dramatic changes in settlement, land use patterns, and farming practices. The most potent force in this revitalization was the much improved accessibility afforded by the construction of new asphalt highways and gravelled secondary roads, local and district roads, and the improvement and upgrading of the existing

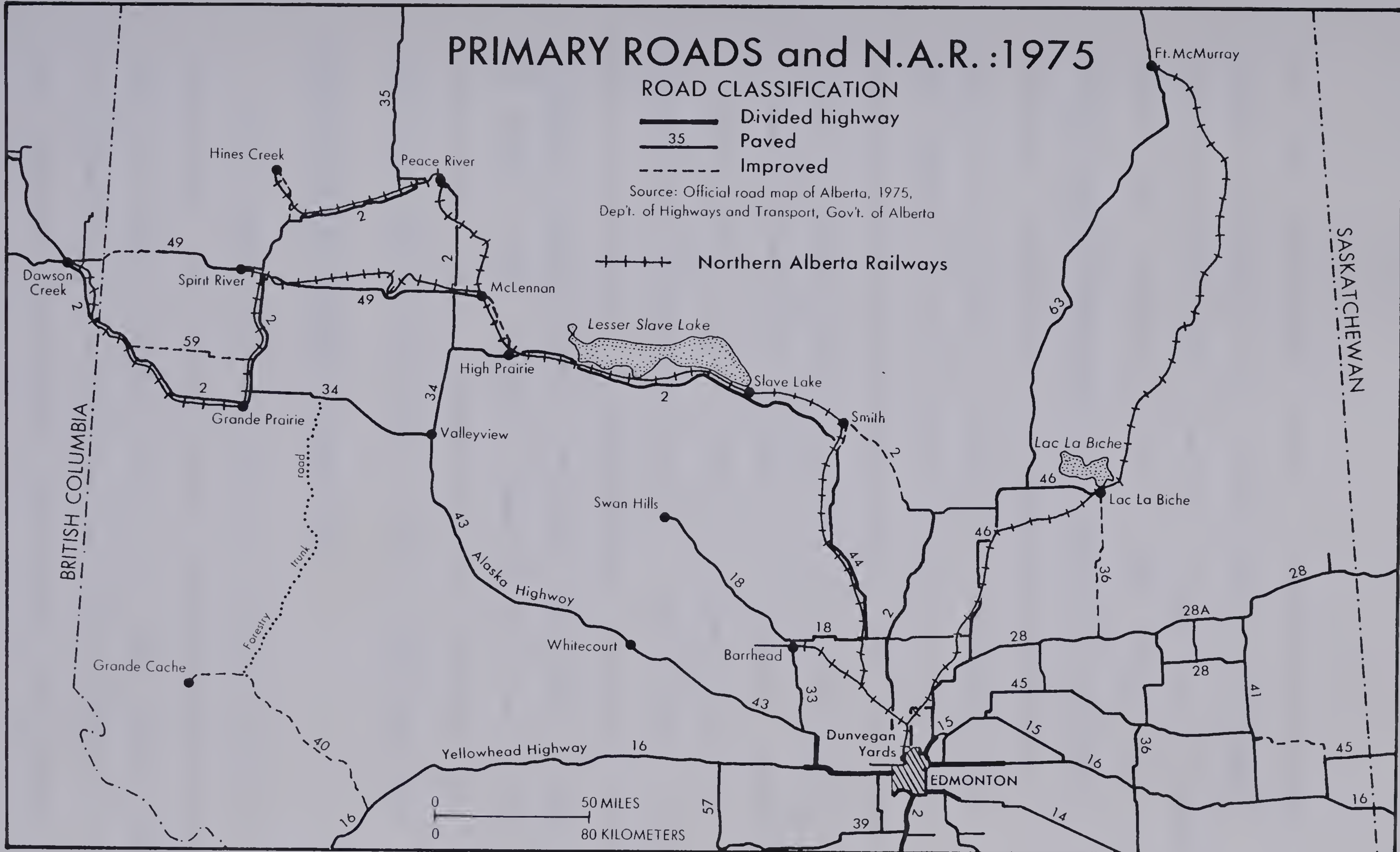
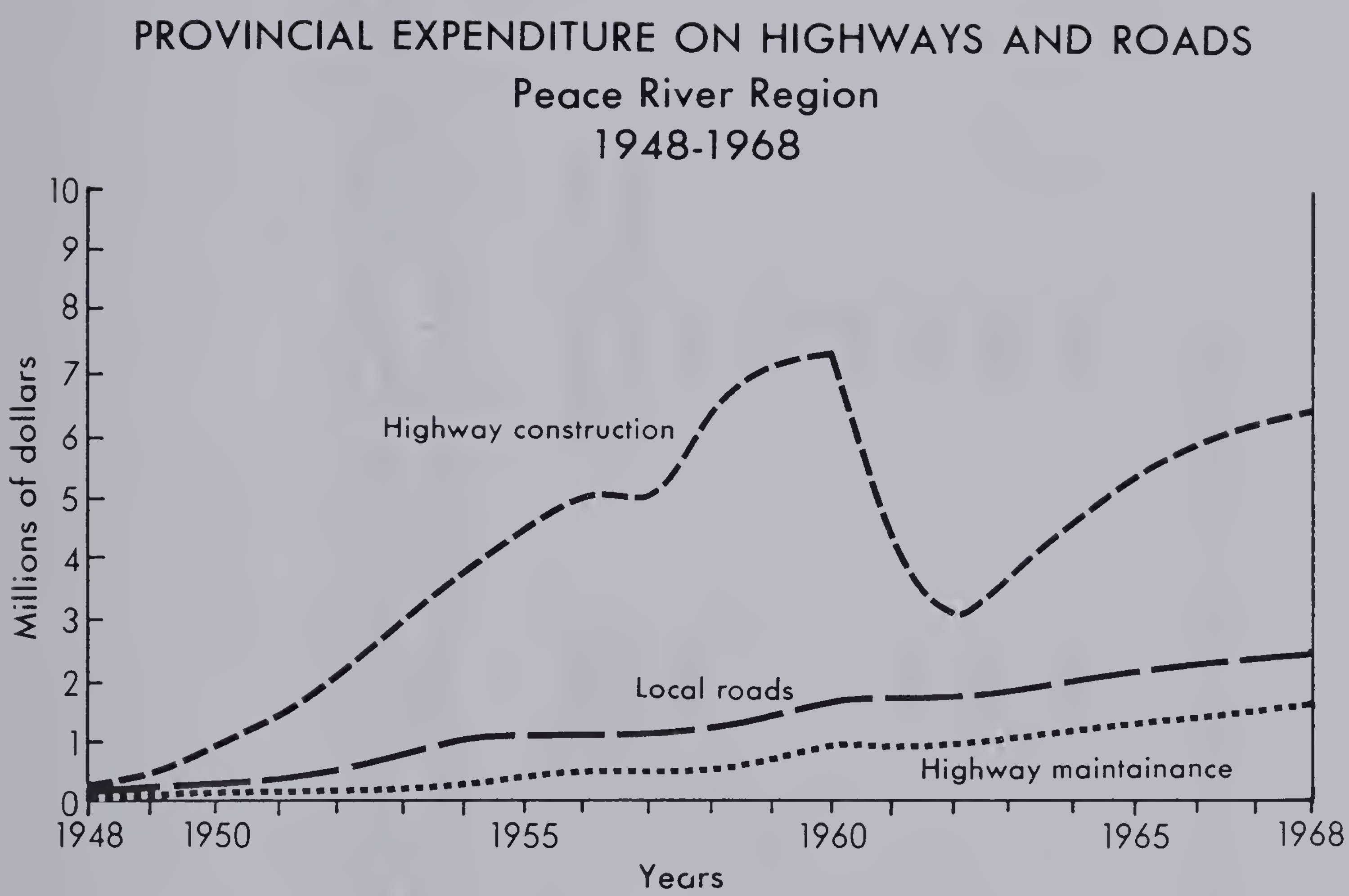

PRIMARY ROADS and N.A.R. :1975
ROAD CLASSIFICATION
Divided highway
35
Paved
Improved
Source: Official road map of Alberta, 1975,
Dep't. of Highways and Transport, Gov't. of Alberta
Northern Alberta Railways
BRITISH COLUMBIA
SASKATCHEWAN
Ft. McMurray
Hines Creek
Peace River
Dawson Creek
Spirit River
McLennan
Lesser Slave Lake
High Prairie
Slave Lake
Smith
Grande Prairie
Valleyview
Lac La Biche
Lac La Biche
Swan Hills
Alaska Highway
Whitecourt
Barrhead
Grande Cache
Forestry trunk road
Dunvegan Yards
EDMONTON
Yellowhead Highway
0
50 MILES
0
80 KILOMETERS

FIGURE 3.7

earth roads to all-weather category. The magnitude of these changes is reflected in the increased amount of money spent annually by the Provincial Government of Alberta which increased from $479,856 in 1950 to $8,280,064 in 1960 (Figure 3.8). This post-war highways development was in part due to a better knowledge of road building techniques, the great technological advances made in the construction and manufacture of motor vehicles, and to the incentive created in 1942 by the commencement of the Alaska Highway Project, which was financed entirely by the American Government and to a certain extent, on the immediate availability of "war surplus" trucks. The number of trucks owned and in use by the farming communities alone burgeoned from 991 registered vehicles in 1946 to 9373 in 1966, while the total number of commercial freight vehicles registered in the area increased from a little over 3,000 units in 1946 to over 10,000 in 1966. Similarly, there has been a marked increase in the number of private automobiles used in the region which had risen from 4,000 in 1946 to about 17,900 in 1966 (Table 3.2).

Factors Affecting Road-Rail Competition

"It is often said that railways had a virtual monopoly of inland transport and that the internal combustion engine forced them into a competitive world for the first time." (Currie 1967). This statement by Currie identifies the drastic change which took place between the 1930's and the 1950's when trucking became a



Source: Department of Highways, Alberta. Annual Reports 1948 to 1968

FIGURE 3.8

TABLE 3.2

NUMBER OF FARM TRUCKS, PASSENGER CARS, COMMERCIAL TRUCK-TRACTORS, AND PRIVATE AND COMMERCIAL TRUCKS REGISTERED IN THE PEACE RIVER REGION - CENSUS DIVISION 15: 1946 - 1976

Years	Trucks on Farms	Passenger Cars	Commercial Truck Tractor-Trailers	Private and Commercial Trucks
1946	991	4001	3630	--
1956	5455	--	9702	--
1961	7150	--	10295	12022
1966	9373	17876	10952	15098
1971	10839	21739	11441	20473
1976	14220	27288	12157	27968

SOURCE: Unpublished Data, Alberta Bureau of Statistics

major competitor of the railways. In the past 30 years, there has been increasingly keen competition between rail and road transport due mainly to certain inherent advantages possessed by the latter. It must be emphasized that there are three fundamental factors which are important to shippers of higher value items, particularly manufactured goods. These are:

(a) that the goods be moved out to a prescribed destination as quickly as possible;

(b) that the facilities for such movements be safe, efficient, and reliable; and

(c) that the rate charged for such movement be as low as possible.

While the question of rates (which will be dealt with briefly later in this chapter) determines that rail transport is generally cheaper than road transport and may dictate to the shipper the choice of the transportation mode, there are also a number of other factors, which when collectively taken into consideration may overcome the transportation cost factor. Some of these are included under the broad term of "service", which has become a predominant influence in the movement of certain goods, which generally seem to favour road transport. This demand for what has been termed "premium service" is due, according to Barloon, to "a continuing growth in that segment of the national product of tangible goods consisting of higher valued, more highly processed, and more intricately designed goods which has generated a differentially

greater growth in demand for higher service standards of transportation and enabled a growing percentage of the cargo moved to absorb the associated higher costs." (Barloon 1969). In defining premium transportation services, Barloon refers to the movement of goods in small lots, with short door-to-door delivery time, subject to low levels of loss and damage and a high predictability of arrival time. All this can be better furnished by highway transportation as compared to rail movement.

Generally speaking, the service provided by trucks is superior to that given by the railway. The motor vehicle scores over its competitor in speed, flexibility, convenience, reliability, and the virtual elimination of transit breakages, theft, and losses. Of prime importance is the factor of time. Benjamin Chinitz says that "on the average, the excess of elapsed time by rail over lapsed time by truck can be reckoned by the following formula: 48 hours plus 8.55 hours for each 100 miles (160 km). The figure of 48 arises out of the trucks greater efficiency at origin and destination; the figure of 8.55 from the trucks' greater efficiency on the trip between origin and destination. Saving 48 hours, irrespective of length of haul, means, of course, that the shipper saves relatively more, the shorter the haul. On a 100 mile (160 km) trip, truck time is only 9 per cent of rail time. On a 500 mile (800 km) trip, truck time is 24 per cent of rail time. Thus the truck represents a greater boon to the short haul shipper than to the long haul shipper." (Chinitz 1969).

Most users of transportation in Northern Alberta maintain that road transport offers a more specific and quicker delivery time. There is no transhipment of goods involved and once a truck is loaded (and this is hardly the capacity of a single car in a train load), it takes to the highway and maintains an average speed of 80 km to 90 km an hour and can reach any of the numerous points of destination within the N.A.R. hinterland in under ten hours. This degree of speed and flexibility of operations cannot be matched by rail. Thus we find that for moving manufactured goods from the cities of Edmonton or Calgary, to the towns of Northern Alberta such as Grande Prairie, Peace River, Barrhead, and Fort McMurray, the truck is eminently suitable. Trucks carrying manufactured goods, clothing, footwear, processed foods, electrical equipment, farm machinery parts, automobile equipment, and household appliances can be carried quickly from Edmonton to the Peace River area for distribution and return with loads including farm products such as eggs and poultry, dairy products, market garden produce, and livestock, thus eliminating 'dead mileage'. Where traffic is light, and moderate loads ranging between 10 to 15 tonnes are available at frequent intervals (a minimum of twice to three times a day), and where distances do not exceed 400 km to 500 km, motor transport is more economical in terms of time and cost.

In contrast, the railway, in order to achieve profitable operations, requires a regular and dense traffic to compensate for its heavy capital costs. A number of factors make railroad move-

ment of goods more time consuming. Some of these include terminal delays which are caused by waiting for full car loads, train formation, adherence to strict time schedules, transhipment, and loading and unloading into road vehicles. Road transportation, on the other hand, is flexible in its operation, is not tied down by rigid time schedules, is not hampered by transhipment delays, and with door-to-door service, has significantly reduced damage to, and loss and theft of goods.

During the initial years of road-rail competition in Northern Alberta, the truckers had started to capture the relatively high value, low bulk freight, because they possessed certain undisputed advantages over the N.A.R. with regard to short haul traffic. The distance range that constitutes a 'short haul' is the debatable point; it has apparently expanded through time. General opinions (Jackman 1926) specified an average economic range for trucking operations at about 80 km to 100 km with distances varying from as much as 160 km to a conservative low of 40 km. In 1932, the Interstate Commerce Commission observed that "the area in which the truck has most effectively supplanted rail traffic is that which can be served one or more times during the day; the area within which overnight delivery can be made, is a fertile field for the trucks; and to points more distant, the service advantages of the truck are lessened until a zone of indifference or disadvantage is reached." (I.C.C. 1932). In 1950, the Vice-President (Traffic) of the C.P.R. stated that "very little freight moved by rail for less

than 50 miles (80 km) and not much more within 100 miles or 160 km." (Royal Commission 1951). A study for the Gordon Commission in 1956 (Hailey 1956) stated that the "greatest concentration of inter-regional motor truck activity is on routes between 20 miles (30 km) and 600 miles (965 km)". The applicability of these latter statements would then mean that a zone ranging between 480 km (300 miles) to 800 km (500 miles) from Edmonton would indeed be "a fertile field for the trucks". From the writer's personal knowledge of the regions served and further evidence gained from enquiries, it is evident that the towns of Peace River, Grande Prairie, Dawson Creek, B.C., and Fort McMurray are within this zone and are well served by overnight truck deliveries of a wide range and variety of merchandise: furniture, television and radio sets, household appliances, building supplies, food accessories, light machinery, and miscellaneous packaged goods. In short, miscellaneous manufactured goods ordered the previous day from Edmonton or Calgary are delivered the next morning to all major centres in Northern Alberta.

During the past 30 years, the construction of better highways and roads, and their extensions into the fringe areas of settlement, the treatment of road surfaces during the winter, the use of more powerful and larger carrying capacity trucks, as well as semi-trailers and tractor trailers which are equipped with special facilities for carrying automobiles and trucks, petroleum products, livestock, milk and dairy products, horticultural produce, and

also, the practice of using two drivers to avoid rest and stop over periods, have all combined to considerably increase the economic range and speed of truck operations. In view of these factors, it is obvious that the hinterland of the Northern Alberta Railways is in fact, well within the 'short haul operational range' of the truck.

In the long run, freight traffic will inevitably gravitate to the mode of transport that serves the shipper's needs most efficiently and economically. Efficiency advances during the past two decades have been more rapid in the trucking than in the railroad industry. Much of this improvement was, as we have seen, due to the technological development of larger, faster, more efficient and better equipped road vehicles, and the simultaneous improvements in road and highway construction techniques. Similar improvements have been slow to materialize in the railways' operations and this time lag in implementing improvements has often given the competition more than a head start. A case in point is the use of heavier rail on the N.A.R. lines. It is hard to imagine why the Railway did not use the heavier 55 kg (120 lb to the yard) rail instead of the 35 and 45 kg rail on the entire system when they initiated their rail relaying programme in the 1930's. This programme has continued at a comparatively slow pace right to the present decade and is as yet incomplete (Figure 3.9). In 1969, there were still nearly 500 km of 25 kg rail on the northeast line to Fort McMurray to be


NORTHERN ALBERTA RAILWAYS
TYPE OF RAIL
100 lb. — 451 miles
85 lb. — 268 miles
70 lb. — 32 miles
60 lb. — 171 miles
SASKATCHEWAN
BRITISH COLUMBIA
Peace River
Dawson Creek
Hines Creek
Fairview
Whitelaw
Grimshaw
Rama
Peace River
Judah
Spirit River
Rycroft
Eaglesham
McLennan
Braeburn
Grande Prairie
Lesser Slave Lake
Joussard
Smith
SWAN HILLS
Jarvis
Pibroch
Barrhead
Manola
Carbondale
Dunvegan Yards
EDMONTON
Egremont
Boyle
Lac La Biche
Lac La Biche
Imperial Mills
Margie
Quigley
Waterways
Draper
North Saskatchewan River
Athabasca River
0 50 MILES
0 80 KILOMETRES

FIGURE 3.9

replaced, and having left this section to the very last, the N.A.R. has, since the major Tar Sands development was launched, lost traffic to the trucking industry. The light rail and poor roadbed could not cope with the heavy traffic which this section is now generating. From this, one might wonder whether the 45 kg rail on the main northwest line would be heavy enough to withstand the heavy traffic that can be expected if the Alaska Oil Pipeline is constructed in the future.

It is inappropriate to look upon trucks as the only competitors of the Northern Alberta Railways, for, in effect, pipelines and electric wires are also competitors of the railway. The increasing use of electricity, gas and fuel oils have ruined much of the movement of coal by rail thus creating a loss in revenues. These losses were further accentuated as airplanes, buses, and private passenger cars cut deeply into railway passenger revenues which, as Table 3.3 shows, declined rapidly. As a result of these dwindling revenues, the N.A.R. reduced its passenger services to twice a week on all lines. Still another factor cutting into N.A.R. traffic has been the development of competing railways encroaching into its hinterland.

In 1958, the last lap of the Pacific and Great Eastern Railway, now known as the British Columbia Railway, was completed by the Government of British Columbia, thus linking Dawson Creek and Fort St. John to the west coast. Consequently, some traffic consisting of grain and lumber from the Upper Peace region, as

TABLE 3.3

N.A.R. PASSENGER EARNINGS IN DOLLARS: 1940 - 1968

1940	$ 241,043	1950	$493,319
1941	316,255	1952	455,518
1942	846,252	1954	377,359
1943	2,171,096	1956	377,340
1944	1,136,453	1958	282,923
1945	743,650	1960	139,277
1946	772,663	1962	82,304
1947	605,717	1964	94,984
1948	543,269	1966	70,311
1949	546,826	1968	26,630

SOURCE: N.A.R. Records

well as some mineral ores and other miscellaneous goods which had moved exclusively on the N.A.R. was now lost to this competing rail line. In 1969, for example, 2576 cars carrying grain and lumber were interchanged at Dawson Creek. In addition to the British Columbia Railway, the Alberta Resources Railway which was completed in November 1968, connecting Grande Prairie with the main Canadian National Railway line at Solomon (near Hinton), has captured some of the N.A.R.'s traffic in lumber and grain.

Thus, in summing up, with the Alaska Highway in operation, the construction of the MacKenzie Highway from Grimshaw to Hay River (N.W.T.) in progress, the completion of Highways 43 and 34 in 1955 (which provided rapid access to the Peace River region) and the improved surfacing of Highways 2 and 63 running north from Edmonton, competition for the L.C.L.* Express, and other "high-value, low-bulk" railway freight movement commenced in earnest in the late 1950's.

The success of the trucking industry in capturing this lucrative business from the N.A.R. is clearly illustrated in Table 3.4 which reveals the rapidly dwindling volume of L.C.L. and Express freight on the N.A.R. since 1949.

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*L.C.L. is a term used for the Less-than-car-load shipments.

TABLE 3.4

MOVEMENT OF L.C.L. AND EXPRESS FREIGHT ON THE N.A.R. IN CARS

Years:	1949	1950	1951	1953	1956	1958	1960	1962	1965	1966
No. of Cars:	7700	6658	5815	5758	5750	4576	3457	2247	1363	97

Source: N.A.R. Records

Note: Each rail car loads to a maximum capacity of 40 tonnes

This success should be attributed to the unmatched services that only road transport can provide for the increasing population in Northern Alberta, particularly, the rapidly growing Peace River region, which had an increase of approximately 43% between the years 1951 and 1966 (Table 3.5).

TABLE 3.5

POPULATION IN CENSUS DIVISION 15 (PEACE RIVER REGION)
1911 - 1966

1911	1921	1931	1941	1951	1956	1961	1966
5111	20817	44447	53491	61800	70417	76884	88344

SOURCE: D.B.S. Census of Canada, Relevant Years
Bulletin 1.1-10
Volume 1 (1-6)

Concomitant with this population growth, there was a rapid increase in the value of retail sales in this region (Table 3.6) and an

even more remarkable increase in retail sales in the larger urban trading centres, particularly Grande Prairie and Peace River (Table 3.7), which is an indication of the demands for an ever-increasing amount and variety of general merchandise, food and beverages, clothing and hardware, all of which must be imported into the area from Edmonton, Calgary and other distant manufacturing and distributing centres. Of the $54.5 million in sales within this division in 1961, approximately $34 million worth may be accredited to the sales of the above mentioned goods, all of which would generally be classified and conveyed as L.C.L. shipments (Table 3.8).

By 1967, there were less than 100 rail cars being used to move L.C.L. freight on the N.A.R., and it was evident that well over 90% of this type of freight moving into Northern Alberta was being conveyed by trucks whose "premium services" were better suited, not only for this kind of traffic, but as well for the needs of the small businesses, general merchants and retail sales outlets so characteristic of the many small scattered towns and few large urban centres that characterize Northern Alberta.

Another form of increased competition for the N.A.R. since 1950, involved the movement of livestock to feedlots and meat packing plants in Edmonton. Ever since the settlement process in the Peace River region commenced, grain and livestock have been the main products of the farms and for decades, both of these commodities had been hauled exclusively by the N.A.R.. Grain is

TABLE 3.6

VALUE OF RETAIL SALES IN CENSUS DIVISION 15
(PEACE RIVER REGION): 1951-1966

1951	1961	1964	1965	1966
$30,649,000	$54,585,000	$72,723,000	$85,442,600	$91,276,000

TABLE 3.7

VALUE OF RETAIL SALES IN GRANDE PRAIRIE
AND PEACE RIVER: 1951-1966

	1951	1961	1964	1965	1966
Grande Prairie	$ 7,225,800	$13,878,100	$28,338,440	$31,830,771	$33,560,000
Peace River	$ 3,813,600	$ 6,499,500	$ 6,123,650	$10,683,350	$14,266,000

TABLE 3.8

VALUE OF RETAIL SALES BY TYPE OF OUTLET
IN CENSUS DIVISION 15: 1961

Clothing	Hardware & Furnishing	Other Retail	Food & Beverages	General Merchandise	Automotives
$1,615,100	$ 2,740,400	$ 5,424,600	$ 8,611,400	$16,343,100	$19,850,400

SOURCE: D.B.S. Census of Canada, Retail Trade Vol. 6.12, Canada Department of Trade and Commerce, Ottawa, 1961

still captive to the railway due to the implementation of regulatory rates (Crowsnest Pass Rates) which were brought into effect during the time when the C.P.R. was leasing the operation of these lines between 1920 and 1925 and they have remained in effect since that time. As Table 3.9 illustrates, there was a rapid decline in the amount of livestock carried by the railroad even though there was a marked increase in the emphasis on livestock farming in the Peace Region (Table 3.10).

TABLE 3.9

LIVESTOCK SHIPMENTS BY THE N.A.R. in CARLOADS

1955	1956	1959	1961	1963	1965	1966	1967	1968	1969	1970
2682	2641	1850	876	548	161	88	45	10	--	--

SOURCE: N.A.R. Records

This emphasis on livestock farming has been a growing trend in the overall diversification of farming operations in the Peace River Country. While the increasing demand and better prices being commanded by livestock products have influenced these changing philosophies of the Peace River farmers, three other major reasons for this expansion are obvious. First, the vastly improved "quarter section" roads, most of which have been gravelled and surfaced, have enabled trucks to carry livestock from the farm direct to the meat packing plants in Edmonton.

TABLE 3.10

TOTAL NUMBER OF CATTLE, HOGS AND SHEEP IN THE PEACE REGION

	Cattle	Hogs	Sheep
1951	54,620	49,369	7,600
1956	92,394	87,026	11,110
1961	116,178	114,497	20,071
1966	136,254	59,962	11,367

SOURCE: i) D.B.S., Census of Canada; 1951 - 1966 Agriculture Bulleton A. 204.
ii) Alberta Department of Agriculture, Relevant Years.

Second, the speed, convenience, and facility by which livestock can be delivered to the consignees, which reduces loss of weight and shrinkage of the animals, which is a very common result when livestock is moved by rail. Third, the freight rate for livestock is considerably lower by truck than by rail (Table 3.11).

It may be observed from the table that there were rapid increases in the rail rates between 1950 and 1961. Furthermore, livestock hauling by truck is often a "back haul" load, and from enquiries it is apparent that livestock are being hauled out of the Peace River region by truckers who charge at least 10 cents per 50 kg less than the published rate. As mentioned earlier, trucks have captured 80 per cent of the L.C.L. and express freight as well as miscellaneous items of manufactured goods, which are destined for the communities of the Peace River Country and the Northwest Territories, and hence, having had reasonably full loads in the northbound direction, are prepared to cut rates drastically on the return journey. The "back haul" rates quoted need to be high enough to cover variable and a portion of fixed costs. The trucker can do this, because the costs of driving his truck back home are substantially the same whether it is empty or partially full. This is particularly true of the small trucking operations, which rarely adhere to any time schedule. Brief investigations show that once enough freight as can be legally carried has been acquired to cover these costs, the trucker takes to the road. The major trucking firms that operate into the

TABLE 3.11

FREIGHT RATES ON LIVESTOCK BY
ROAD AND RAIL TRANSPORT FROM SELECTED
POINTS TO EDMONTON

Years	1948		1951		1956		1961		1966		1970	
	Rail	Road	Rail	Road	Rail	Road	Rail	Road	Rail	Road	Rail	Road
High Prairie	33		40		55		61		66	70	85	70
Peace River	38		52		52		56		60	75	78	75
Fairview	42		56		56		88		95	80	111	80
Grande Prairie	56		67		101		111		111	90	113	90

(Road): Rate in cents per 45.36 kg (100 lbs)
SOURCE: Alberta Freight Bureau

(Rail): Rate in cents per 45.36 (100 lbs)
SOURCE: N.A.R. Office, Edmonton

North - Byers and Grimshaw Transport, for example, have freight depots at many major points in the Peace River Country and with their main offices in Edmonton, solicit and contract most of the freight they haul. Even with these firms, their truckers are instructed to solicit traffic for the return trip when no "back haul" traffic has been contracted. It is in these particular phases of trucking operations that the railway cannot compete.

Sometimes there could be reason to consider such competition as "unfair" and while some provinces in Canada have regulations on the types of freight which can be carried in trucks, the Provincial Government of Alberta has been reluctant to adopt such regulations for many reasons, the main ones being the difficulty of enforcement and also, the philosophy that competition between the two major haulers of inland freight serves the public interest.

Realizing that much traffic was being diverted to trucking, the N.A.R. decided to concentrate on rate reductions as a means of recovering some of the lost traffic. This approach was apparently substantiated by a number of anaylses pertaining to the relative costs of hauling goods by road as compared to those by rail. Experts for the Gordon Commission in 1956, estimated that costs per vehicle mile were 50 cents for trucks up to 2 1/2 tons (about 20 cents per ton mile) capacity; 36 cents for trucks between 10 and 15 tons (about 3 cents per ton mile); and 41 cents for trucks over 15 tons (over 5 cents per ton mile). These experts believed

that in Canada, generally, to move a ton of freight one mile costs 0.2 cents to 0.5 cents by water (the Great Lakes), 0.3 cents by pipeline, 1.5 cents by rail, 49 cents by air, and 5 to 6 cents by motor vehicles (Currie 1967).

Rapidity of change has been the outstanding characteristic of transportation not only in this region, but the world over in the past several decades. Principal among these changes has been the sustained and rapid development of other modes of transportation besides the railway, highway, pipeline, and air. While the development of these other modes has unquestionably contributed in many important respects to the greater strength and versatility of the region's total transportation complex, it has also created serious problems not only for the N.A.R., but for the two rail giants - the C.N.R. and C.P.R. - which are the parents of this railway.

For the railways, the growth of these other modes of transportation has presented many problems of adjustment to new and drastically different competitive conditions. Their impact was submerged only temporarily by the tremendous requirements during World War II. It must be clearly understood that the railways cannot properly object, and indeed they do not, to the sound economic development of other forms of transportation. They know that they can make no valid claim of entitlement to traffic simply on the ground that they have had it before. However, the N.A.R., together with the parent companies, has vigourously objected,

though not successfully at times, and will continue to object to the continuance of unequal conditions of competition. These have been fostered by government policies and also by the maintenance of regulatory standards and habits of thinking tied to the past when the railway had a monopoly on freight and passenger traffic.

Under existing conditions, it can be argued that the railway does not have an equal opportunity to compete. Among various transportation modes, only the railroad has to bear the full burden of costs of providing, maintaining and paying taxes on its right-of-way. Except for the pipelines, which are "specialized carriers", the competitors of the railway - roads, waterways, and airways - all operate on <u>public</u> rights-of-way which are not subject to taxation as property and in which the carriers bear none of the costs and risks of ownership and capital investment. True, commercial trucking firms that serve Northern Alberta like Grimshaw, Byers, Spendiff, among many others, do pay certain "user" charges, which they contend are adequate to cover their share of highway costs. While this has been their consistent position over the years in resisting proposals for special charges on large and heavy commercial vehicles, it should be mentioned that the user charges (acquired from higher registration taxes of the vehicles) paid by these vehicles, considering their weight, their size, their annual mileages and their operating characteristics, are minimal when compared with the licence fees paid by private automobiles and trucks.

The other aspect of the competition that posed a problem was one that pertained to regulations of the Board of Transport Commissioners. Although the transportation facilities have become increasingly competitive, the railways, not only the N.A.R., but those across Canada, continued to be subject to monopoly type regulations fashioned many years ago. And for the most part, the competition with which the regulated railways had to contend with was not subject to the same degree of regulation. This is the essential basis for the contention that the railway, as a kind of transportation enterprise which requires large volumes of traffic in order to achieve low unit costs, must have greater freedom to compete, especially in the matter of rates and charges for their services.

The imposition of regulatory controls and demand-oriented rate making policies which were applied to the rates and services of the rail carriers were finally eliminated by provisions in the National Transportation Act of 1967. Pertinent sections of the Railway Act were deleted (Sec. 329-5) and a new section included (Sec. 334). In effect, it provided the railways greater freedom than before in the setting of rates. Referring to this license, Currie stated:

> "Maximum rates applied only to captive shippers, those who had no practicable alternative to rail transport. Minimum rates had to be compensatory; they must cover the variable costs of handling the traffic in question. Between these upper and lower limits, railways were to have more freedom than formerly to quote rates as they saw fit." (Currie 1967)

Based to a large extent on the recommendations of the Royal Commission Report of 1961 (MacPherson Commission), the 1967 Transportation Act (Sec. 1) thus emphasized "a policy of deregulation, with competition within and among modes as a major 'regulator' of rates." (Hall Commission 1977).

The National Transportation Act also created the Canadian Transport Commission (C.T.C.), a new regulatory body to implement the changes authorized by Parliament. In effect, this new Commission took over the powers, duties and functions of the former Board of Transport Commissioners, the Air Transport Board, and the Canadian Maritime Commission (all three were dissolved in 1967). This overall jurisdiction of the C.T.C. is evidenced in section 14 of the 1967 Act which reads, in part, as follows:

> "It is the duty of the Commission to perform the functions vested in the Commission by this Act, the Railway Act, the Aeronautics Act, and the Transport Act with the object of co-ordinating and harmonizing the operations of all carriers engaged in transport by railways, water, aircraft, extra-provincial motor vehicle transport, and commodity pipelines; and the Commission ...such fair interpretation as will best attain that object." (National Transportation Act 1967, Sec. 14)

Anatomy of the Railway Freight Rate Structure

Freight rates are fundamentally important in the geography of flow and movement - the dynamic aspect of transportation geography - and the few freight rate studies which have been made in recent years have been on a national and regional basis rather than on a

particular system. It is not the purpose of this treatise to delve into the rates used on the N.A.R. for it must be remembered that freight charges levied by this railway are often those set by the parent companies, the C.N. and C.P.. Further, this is an intimidating topic, as Ullman and Mayer state, "rate structures are so complex that to even generalize them is extraordinarily difficult." (Ullman & Mayer 1954). However, an attempt will be made to show how some of the railroad freight charges have influenced the changing patterns of economic acivity in the area served by the N.A.R., and have also had a bearing on some elements of traffic movement on this railway. In this respect, one must agree with Alexander, who said:

> "In a commercial economy having specialized transportation, the movement of goods is influenced by several forces, one of which is the freight rate structure. The spatial differences in transport charges are not only a geographic factor influencing the circulation of goods but also a geographic element in terms of which the character of a region may be expressed.... Thus, as a geographic element lending character to location of economic activities, freight rates have significance and in most geographic treatises dealing with economic activity, scarcely any but the most cursory mention is made of transport costs." (Alexander 1958).

For railroads, the allocation of costs to a particular type of freight and the setting of a rate on it is a rather arbitrary and complex matter. A railway provides a great many services.

The same locomotive may haul, the same track support, and the same crew move traffic in agricultural products, forest products, mineral ores, livestock, manufactured goods, passengers, mail, and express. It is extremely difficult to allocate the respective costs of operating the locomotive: fuel, lubricants, depreciation, car rentals, repairs, etc., or the cost in wages for labour, to each of the variety of goods hauled. The determination of rates is largely a matter of human judgement for "the task of constructing a freight rate or passenger tariff is an eminently practical one. The process must be tentative and experimental. Little can be calculated in advance. Tariffs are not made out of hand: they grow. Not until a rate has been put into effect, can its results be known." (Ripley 1913).

According to Mr. Perry, former General Manager of the N.A.R., railways have, over the years, established a sort of formula which takes into consideration the following factors when considering the setting of a rate. These are:

(a) Cost of the service to the carrier,

(b) Value of the service to the carrier,

(c) Value of the article,

(d) Nature of the article - whether crude or finished liquid or dry, etc.,

(e) Risk in handling the article,

(f) Distance of haul (mileage scales),

(g) Bulk (size) and weight of the article,

(h) Whether special facilities or extra services are required,

(i) Expense at terminals,

(j) Volume of traffic, and periods of movement,

(k) Method of packing and protecting the article,

(l) Rates on similar articles moving under similar circumstances and conditions,

(m) Rates of competing carriers,

(n) Competition between producing centers or markets,

(o) Whether or not the rate will be conducive to an increasing movement of the article, and

(p) Prospects of cars being returned loaded or empty.

When all of the above factors have been considered, the subsequent rate arrived at will, it is hoped, allow the railroads the necessary revenues to satisfy their shareholders and also enable the shippers to profitably move their products to market. At the same time, the railway is forced to consider the public interest as advocated by the Canadian Transport Commission. In other words, rates must be fair and reasonable to both the railroads and the public.

Since railways are concerned with moving goods and people from one place to another, the question of distance enters into the price of almost all transportation services. As Currie states, "The two principles of 'Cost of Service' and 'Value of Service' affect the adjustment of rates to distance just as they determine

the classification. Cost is the fundamental reason for mileage scales being set up and carefully adhered to. Value of service explains the rather frequent departures from strict mileage." (Currie 1967).

Expenses for handling goods tend to increase with distance, but not in strict proportion to it. This is because there are two elements involved in the cost of movement - terminal costs and line haul costs. Terminal costs include billing, shunting empty cars to originating points, assembling loaded cars, train formation, and sorting out the right cars on to appropriate sidings at destination. These costs are the same whether the car is fully or partially loaded. Further, "less than carload" shipments involve pickup and delivery, loading and unloading between warehouse and freight cars and temporary storage. Hence, a ten kilometre haul incurs the same amount of this terminal cost as a five hundred kilometre haul. Line haul costs, however, depend on the length of the haul and may be discerned as a constant amount per kilometre, increasing more or less directly with distance. Thus, the combination of these two elements results in a rate "taper" with increasing distance - the cost per tonne kilometre declining with an increase in the length of the haul. For many years in western Canada, a Class rate known as the "Prairie Class Rate", was in effect and was often applied in mileage blocks. This class rate exhibits a taper of considerable degree, which is shown in Table 3.12.

TABLE 3.12

GENERAL PRAIRIE CLASS RATE

Miles	Kilometres	Average Rate per Mile (1.6 km) In Cents Per 45.36 kg (100 lbs)
50	80	1.60
200	320	0.75
400	640	0.55
800	1280	0.46
1200	1920	0.42

SOURCE: N.A.R. Documents

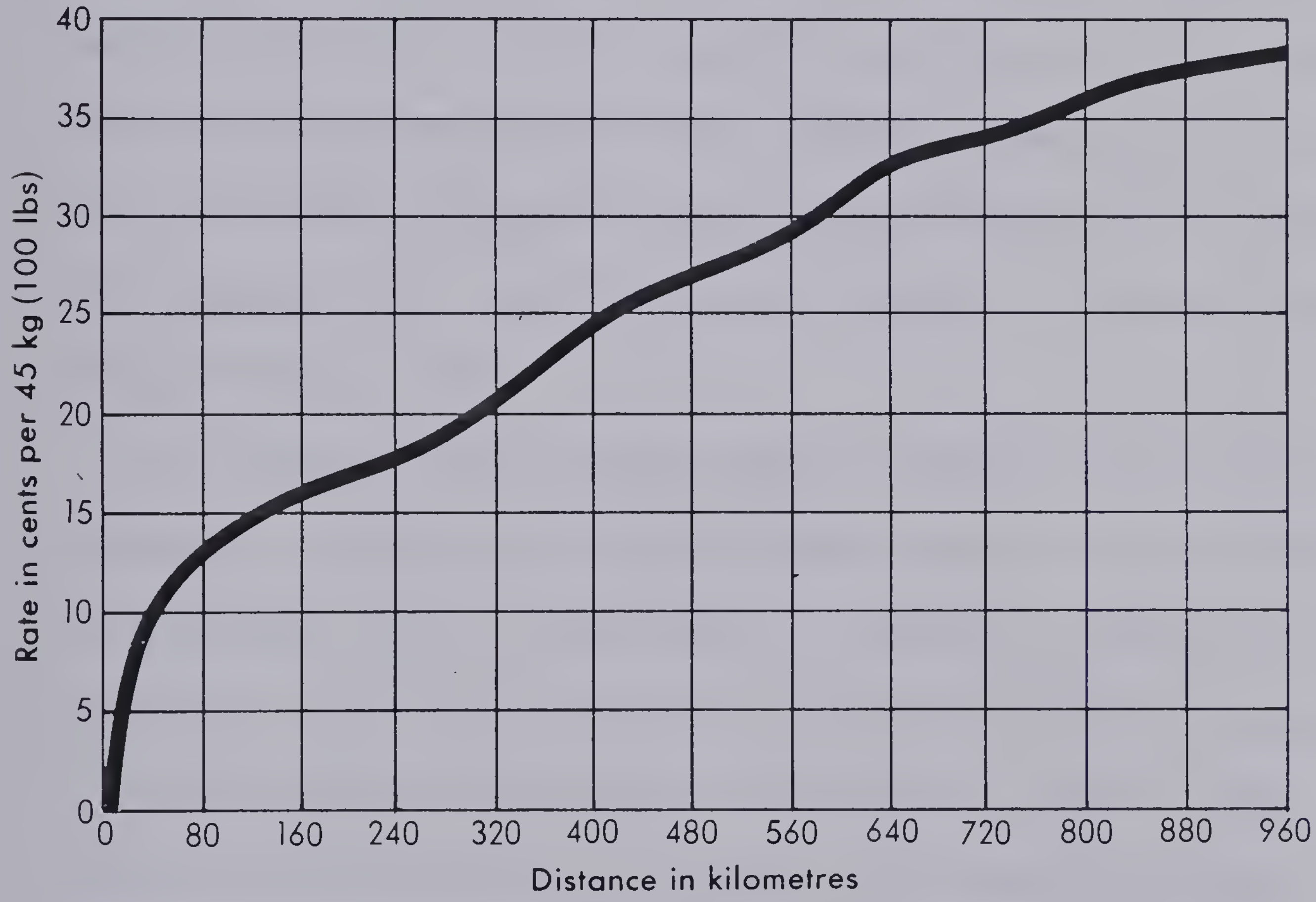
However, most of these class rates had to be modified later by the N.A.R. in order to counter truck competition for the shorter hauls. For example, the rate on building and paving material shows such a "modified taper" (Figure 3.10).

With regard to the commodity-non-competitive rates mentioned earlier, the N.A.R. follows the principle of differential charges which are reflected in the classification of commodities. The railways have for years, persisted in their long cherished practice of discriminating in favour of commodities of low value per ton. Each time they introduced across-the-board percentage increases in freight rates, they made exceptions favouring low-value commodities, particularly raw materials. As a result, the gap between rates on raw materials and rates on finished products has widened. Thus, the more valuable goods have to bear a proportionately higher charge than the bulky low-value commodities which do not bear the full share of the overhead charges. This differentiated rate structure has been adhered to by the N.A.R. since its inception not only because it was convenient to adopt the same rate structures as its parent companies, but as well as the fact that they hoped to maximize their profits - a philosophy that prevails on all railways.

The influence of this Class Rate structure on all types of railway pricing is difficult to determine, for even during the period when the railway held undisputed dominance in Northern

RATE ON BUILDING AND PAVING MATERIAL

NOTE: 'TAPERING OF RATE' 640 KILOMETRES AND OVER



SOURCE: N.A.R. Documents

FIGURE 3.10

Alberta, a very small amount of traffic moved under these rates. Most of the remaining traffic (about 75%) moved at commodity-non-competitive rates. But the structure may have had considerable influence on the shape of the rates applied to other traffic (e.g., lumber).

From July 1, 1927 to July 1, 1949, this "Prairie" standard mileage class rate scale was in effect on the N.A.R.. Due to inequalities in the structure, regional hearings on various proposals to change it were held and a uniform mileage scale rate for all Canadian railways was drawn up by the Board of Transport Commissioners, which came into effect on March 1, 1955 as Class 100 rate* (Currie 1967).

The latest Canadian Freight Classification No. 22, which was approved by the Board of Transport Commissioners, became effective in December 1966. It provides ten classes or groupings of commodities, the rate applicable to each group being a percentage of the rate applied to the Class 100 (formerly Class 1) rates which are related strictly to mileage. For example, the Class 100 rate for 56 km is 60 cents; for 96 km, 90 cents, and for 250 km, 140 cents. So, a commodity in Class 6 will be charged 40 per cent of the Class 100 rates (40% of first class) for these distances.**

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*For the full rate scale, see J.O.R. & R., Vol. 43 no: 23A, page 7.

**The range of Class 1 to 8 and for Class 10 (the 9th Class was formerly used for livestock, which now moves under special rates) is 100%, 85%, 70%, 55%, 45%, 40%, 33%, 30%, and 27%.

In 1967, the Express Traffic Association* of which the N.A.R. is a member, announced a new competitive rate structure which was applicable to both rail L.C.L. shipments as well as rail express freight. In effect, this structure was a formula which charged higher rates per 45.36 kg (100 lb) for small shipments moving short distances and cheaper rates for large shipments moving longer distances. This encourages shippers to load each car to full capacity thereby ensuring full and effective use of the rail cars which are rented by the N.A.R.. Further, the variable costs are the same for the railway, whether the car is partially laden or fully laden, and it is sound economics to load each car to capacity. By encouraging this feature, the railway can afford to cut its rates and this "incentive" rate has indeed encouraged many shippers to conform to maximum loadings for longer distances.

The fact that railways in general, and the N.A.R. in particular, have profitable traffic left, is a real tribute to the inherent efficiency of this form of transport considering that several characteristics of the rail rate structure have actually "pushed" traffic into the truckers' hands. These include:

(i) many unrealistically high rates,

(ii) rates higher for high value commodities than for low value commodities,

---

*Other members of E.T.A. are Canadian National, Canadian Pacific, Algoma Central and the Railway Express Agency. J.O.R. & R. Judgements, Orders, Regulations and Rulings of the Board of Transport.

(iii) inadequate incentives for heavy loading, and

(iv) excessive discounts for long hauls.

With regard to high rates, most class rates and other related rates are so far above trucking rates as to result in virtually no traffic being moved. While the aggregate transport volume of items classified under these "paper" rates was fairly substantial, virtually all of this traffic had been diverted by the mid sixties from the rails to the trucks by a non-competitive format of pricing without an opportunity for relative costs of the two modes of transport to exert any influence at all.

Concerning the second point, the railway's heritage from past monopoly power is a rate structure characterized by a higher railroad freight rate for commodities with a high value per kg than for commodities of lower per kg value. By the same token, if the value of the commodities only should be recognized by the rate structure, exactly the opposite treatment would be more effective in competition with the trucking industry, because trucks reduce the time that merchandise is held up in transit. For the higher the value of the merchandise, the larger is the inventory cost saving due to quick delivery. Hence, to compensate for the railways' comparatively slower service, rail rates should be lower relative to truck charges on high value merchandise than on low value commodities, and this distortion was further aggravated by "across the board" postwar price increases even though during this period the trucking industry

increased its superiority over the railway, with no cost justification for this wide disparity in rates. Thus, rail freight rates were set still further below truck costs on bulky low value commodities for which trucks have never competed, while rail rates have increased relative to truck costs on high value commodities for which the trucking industry had already competed for and largely captured.

The railway's greatest comparative advantage was on shipments too heavy or bulky to fit in a single truck. Yet the typical rail tariff seemingly discarded this advantage by charging the minimum average rate per 45.36 kg for a "car-load" which is approximately the same size as a full truck load. So, at most, shippers were offered one or two alternative minimums (e.g., 10 or 20 tonne shipments), which encouraged loading at such minimums only, never above that (e.g. 40 to 50 tonnes (full box car) shipments). The railway could have very easily increased their profits by offering continuous incentives to heavier loadings per car as well as multiple car shipments in the form of cost savings to the shipper.

With regard to length of haul, the existing tariffs allow discounts per tonne kilometre on longer hauls which far exceeds the distance cost savings to the railway. This pattern of pricing tends to increase the rail rates relative to truck rates on short hauls, thereby increasing the length of haul for which trucks can compete successfully.

The structure of the N.A.R. tariffs has, broadly speaking, followed the general principle of relating the charge to the value of the commodity. However, these charges have never been determined "simply by what it was thought the traffic would bear", because tariff policy has never been determined by only the commercial interests of the railway, nor even by those interests within the constraints of regulations designed to prevent "overcharging" and "undue preference". Further, legislation requires the railway to operate a "differential tariff" in which low rates charged "to assist agriculture, mining, and lumber development" are balanced by high rates for all other traffic. It is often said, that low rated traffic is "charged at rates below cost" when in fact, the more apt explanation of the differential tariff is that the "lower than average" rates charged for some traffic must be balanced by "higher than average rates" for others (Currie 1967). In addition, the current low rail rates on raw materials encourages the location of industries in Eastern Canada. One might possibly conceive of a shift in the location of some industries to the Prairies if the rates on these bulky commodities were raised sufficiently to cover true costs of rail transportation. (Norrie 1976).

Meeting the Competition

Prior to making serious efforts toward meeting the challenge from its competitors, the N.A.R. had, like other railway companies

in Canada, expected the Government to step in and legislate against the competition; for many years they were enthusiastic supporters of rigid control over truckers. The railways felt that trucking rates should be controlled by governments in order to ensure reasonable equality of competition between the two modes of transport. In the course of time, however, it was clear that the public would not tolerate the regulation of trucking to such an extent that the railway's profits would keep increasing, nor was it going to sacrifice the superior services that trucks offered. When these initial attempts failed, the N.A.R., along with other railways in Canada, resorted to some rather aggressive measures in order to recover at least some of the traffic it had lost to competitors. Some of these included reductions in its operating costs through technological change, putting a fleet of trucks into service by means of a master-agency plan, the cutting of rates by modifying the mixing rule, and the implementation of incentive rates, competitive rates, and agreed charges.

Realizing that modern technological innovations in rail transportation could enhance its competitiveness, the N.A.R. implemented a number of technical changes. The fleet of steam-powered locomotives was rapidly phased out in favour of more powerful diesel locomotives (Plates 3.1 & 3.2). This change in turn, necessitated the upgrading of roadbeds, the use of heavier rails, the reduction of grades steeper than 1:100 and curves being kept to a maximum of 13°. By 1970, over 1160 km of the total 1484 km of railway track

PLATE 3.1: G.P. 9 1750 H.P. Diesel Locomotive in Use on N.A.R.

PLATE 3.2: 4 2000 H.P. Diesel Locomotives Hauling a Load on N.A.R. Line Near Judah, Peace River Valley

had been relaid with 45 kg and 40 kg rails. In addition, sidings were lengthened, bridges and embankments strengthened, and ballasting improved in order to accommodate the longer and heavier train loads that the diesel engines were capable of hauling (N.A.R. Engineering Dept. Records). The combined effect of these improvements was apparent in the fifty per cent increase in the average speed of the trains while train loads more than doubled. While the initial costs of these renovations were considerable, they were essential if the railway hoped to compete with the services afforded by road transport.

It should be mentioned here that while the N.A.R. owns its fleet of diesel locomotives*, cabooses, passenger, and inspection cars, almost all of the freight cars used on its lines are rented. This feature is a cost saving factor inasmuch as there is no initial outlay of large sums of money in purchasing freight cars, nor are there the additional costs of repairs and maintenance. Further, railway rolling stock, because of the heavier loading involved (40 to 55 tonnes) is built sturdily to last many years and cannot be readily "scrapped" because of "obsolescence and inefficiency" without incurring heavy losses. Moreover, the number of cars rented is determined solely by demand, as well as the need for the particular kinds of freight moved; for example, hopper cars for grain, tank cars for crude oil and petroleum products, special cars for lumber or ores are used. The cars are rented on a "per diem" basis from the parent companies, the C.N.R. and C.P.R., and are

*By 1969, the N.A.R. owned 17 diesel locomotives, 10 of the 200 series and 7 of the 300 series, as well as 270 units of rolling stock which includes 23 cabooses, 32 flat cars and 8 express and baggage cars, the bulk being work equipment and material cars.

requisitioned from each company on a fifty-fifty basis. If either one of these two companies cannot meet the request, then the other attempts to fulfill the total requirement. There seems to be little or no difficulty in getting the cars required even during the months of peak traffic. Frequently, cars from some U.S. railway companies (the Burlington and Northern, for example, or the Santa Fe) are on N.A.R. lines delivering equipment or machinery, and these cars, rather than being dispatched as "empties", are returned loaded with commodities destined for U.S. markets, for example, lumber (Plates 3.3 & 3.4).

While railways try to keep their operating costs down in order to avoid or minimize increases in rates and the consequent diversion of traffic to their competitors, other factors make this difficult. As the General Manager of the N.A.R remarked, "While these technological improvements to the railway's equipment have contributed to a reduction in operating costs and might have helped re-capture some of the lost traffic, the benefits of these changes were countermanded by higher wages, interest rates, and rental charges, as well as by escalating insurance rates pertaining to thefts, pilferage and damage to freight." (Perry 1972). Nevertheless, the railway would have been in a far worse plight had it not implemented these technological changes and rationalized its plant.

Even though railroads are inherently more efficient than trucks in terms of fuel and labour costs per unit volume, they

PLATE 3.3: Atchison, Topeka & Santa Fe Rail Cars on N.A.R. Line

PLATE 3.4: Burlington Northern Rail Cars on N.A.R. Lines

have had great difficulty in trying to retain or recover high-value traffic. The typical freight train, producing between 80 and 100 tonne kilometres in transportation per litre of fuel as well as "out-producing" the truck in terms of tonne kilometres of freight per worker by a margin of 5.8 to 1, is clearly far ahead of the competition in terms of economy and efficiency. But the railways freight service, even with this efficiency, cannot match (as observed earlier) the "premium service" afforded by trucks. In order to provide a similar service, the N.A.R. administration leased a fleet of trucks in the 1960's to carry the "high-value small lot shipments" out of Edmonton, not only to points on the N.A.R. route, but to communities not served by the rail lines. In addition, the railway contracted with individual truckers and small trucking companies (listed in appendix) to serve those settlements in the "fringe" areas with essential commodities and goods from the nearest rail head. With the completion of a new 560 sq metres (6,000 sq ft) freight and express warehouse at Dunvegan Yards terminal in 1969, transhipment of goods destined for Northern Alberta has been expedited considerably. This facility is fully insulated and heated and is designed to handle loading and unloading at 18 truck doors and 2 rail doors simultaneously. By the mid 1970's, the N.A.R. commenced operating its own fleet of trucks out of Edmonton (Plates 3.5 to 3.8).

In order to co-ordinate this rail-truck service, the railroad management created a Central Agency Service, similar to the

PLATE 3.5: Express Trailers and Rail Cars at Freight Shed, Dunvegan Yards

PLATE 3.6: Express Trailers at Freight Shed, Dunvegan Yards

PLATE 3.7: L.C.L. Freight in Transhipment Shed

PLATE 3.8: Loading N.A.R. Trailers with L.C.L. & Express Freight

Master Agency Plan or Rail Head Principle that was initiated by the parent companies in the late 1950's (Currie 1967). In essence, the Agency provides any consignee within its hinterland with direct and immediate toll free contact with the Agency which provides anticipated time of arrival of carload freight by train or L.C.L. freight by truck. Similarly, shippers can arrange with the Agency the number of cars required for a particular shipment and have them allocated without delay in readiness for loading. In addition, the Agency helps decide whether a particular shipment warrants rail service or truck service and it has the appropriate mode of transportation service available to the shipper.

Having decided to concentrate on rate reductions as a means of recovering some of the lost traffic, the N.A.R. set about its task in a judicious manner. From past experience it had realized that while cutting rates can be a quick and effective way of meeting the competition, it could only be a temporary measure, a "stemming of the tide" as it were, since the competition, by progressively cutting its own rates, could maintain the "status quo" and thus retain the volume of traffic captured from the railway.

In 1955, the railroads in Canada loosened the restrictions imposed on the amount of mixing of commodities permitted in a car which could still enjoy the cheaper car load (C.L.) rate. Prior to this, many goods not under the specific heading in the Class-

ification had to pay the higher L.C.L. freight (Currie 1967). A fairly considerable amount of traffic reverted to the railway almost immediately, and trucks, observing this shift in traffic were forced to cut their own rates by as much as thirty per cent in order to remain competitive (Currie 1967).

Under the impact of competition, particularly from trucks, Class rates and Commodity rates diminished in importance and were encroached on by special rates designed to meet the competition. These came under two broad designations: Competitive Rates and Agreed Charges.

Competitive Rates have been very loosely defined in the Railway Act as "a class of commodity rate that is issued to meet competition." (Railway Act, Section 331). In essence, the National Transportation Act 1967, permits the railway to charge a toll or tolls lower than the published rate between points the Board of Transport Commissioners have declared or deem to be competitive points (Section 23). Even with the equalization of mileage class rates and commodity rates which became operative in 1955, costs of rail transportation to the shipper were often too high to permit low-valued goods like lumber, minerals, and farm products to move in volume and be sold in distant markets. Consequently, the railway sought to introduce special rates for certain commodities in order to ensure a healthy volume of traffic of this nature, and while these lower rates did help retain much of this traffic for the N.A.R., it also assisted

primary producers to sell their products on a competitive basis in the national and international markets. In realization of this, the railway's proposal for initiation and retention of "Competitive commodity rates" was accepted by the Canadian Transport Commission and ratified in 1967.

Similarly, Agreed Charges are a special rate arrangement to combat competition. Although they were introduced in the Transport Act of 1938, they were never fully implemented by the railways till the late 1950's and early 1960's. An essential part of the Agreed Charge contract is the undertaking on the part of the shipper to commit at least eighty per cent, if not all, of this traffic to the railway at an agreed non-fluctuating rate, this rate being renewable annually by mutual agreement. This approach assured the railway of traffic year round with benefits to both the shipper and the railway. By 1965, Agreed Charge contracts, with their lower rail rates and their commitment by the shipper of a large part of his traffic to the railway, had recaptured nearly 15% of the total freight traffic revenues for the railway. Moreover, they had effectively shut out the highway carrier for the period of contract with the shipper. Almost all goods transported today by the N.A.R., are moving on some form of "agreed rate" and thus, it would seem that the published rates are but a base from which negotiations for an "agreed rate" can be arranged. The tables that follow (Tables 3.13, 3.14, 3.15 and

TABLE 3.13

AGREED CHARGE ON MINERAL ORES MOVED ON N.A.R.

Ore:	Actual Valuation Per Ton Of 2,000 Lbs															
Dist.	$10	$20	$30	$40	$50	$60	$70	$80	$90	$100	$110	$120	$130	$140	$150	$200
300	9.15	10.45	11.42	12.61	13.28	13.92	14.55	15.19	15.53	16.05	16.83	17.33	17.93	18.62	19.26	23.51
Inc. by CFA 1000 Effective March 1971	9.25	10.86	11.88	13.11	13.81	14.48	15.13	15.80	16.15	16.69	17.50	17.98	18.65	19.36	20.03	24.45

TABLE 3.14

AGREED CHARGES ON LUMBER MOVED ON N.A.R.
(AGREED CHARGE NO. 2406)

Lumber:		50,000	60M	70M	80M
High Prairie	(239.2 miles)=	(26¢ =%5)=27%	27	26	25
Gr. Prairie to Edonton	(406.9 miles)=	(41¢ + 5%)=43¢	42	41	40
Waterways to Edmonton	(304.7 miles)=	(31¢ + 5%)=33&	33	32	30

TABLE 3.15

SPECIAL RATES ON LIVESTOCK MOVED
ON NORTHERN ALBERTA RAILWAYS

CFC 22

Livestock	Min.	Class	300 Mile Block
Horses, Mules or Ponies	20,000 lbs	40=	1.20
Hogs	16,000 lbs	33=	1.01
Sheep and Lambs	14,000 lbs	33=	1.01
Calves, under 6 mo. old	16,000 lbs	33=	1.01
Cattle	20,000 lbs	33=	1.01

SOURCE: N.A.R. Documents

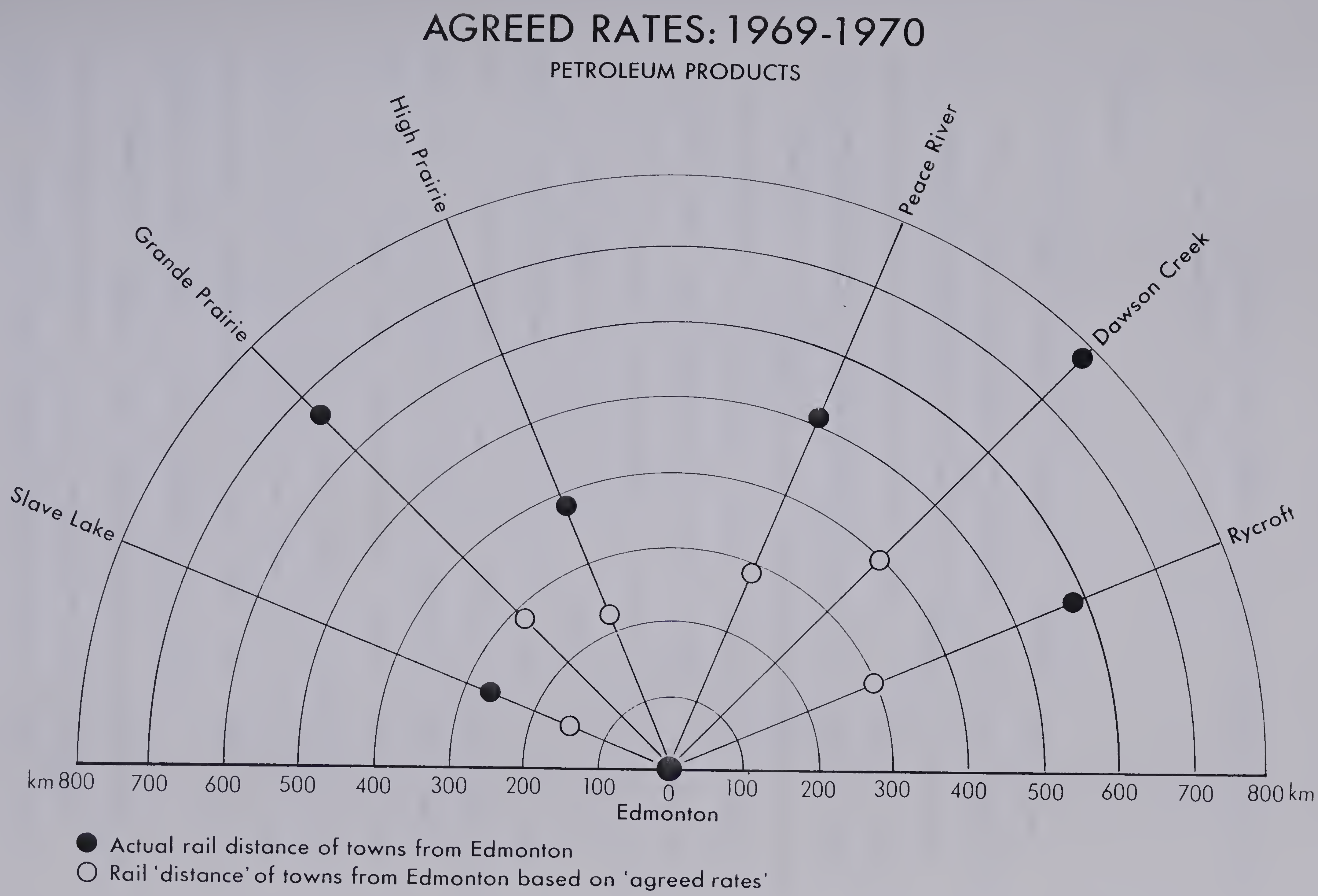

AGREED RATES: 1969-1970
PETROLEUM PRODUCTS
High Prairie
Peace River
Grande Prairie
Dawson Creek
Slave Lake
Rycroft
km 800 700 600 500 400 300 200 100 0 100 200 300 400 500 600 700 800 km
Edmonton
Actual rail distance of towns from Edmonton
Rail 'distance' of towns from Edmonton based on 'agreed rates'

FIGURE 3.11

Figure 3.11) illustrate some examples of agreed charges for one or two selected commodities moved on the N.A.R..

Summary

There has been a constant struggle for traffic between road and rail which has continued in this decade. As Currie described it, "Road-rail competition is constantly widening into new geographic areas and different kinds of traffic. It takes the form of improved service and the publication of new rates." (Currie 1967).

Stability of rates and the relatively strict adherence to the Class and Commodity rates lasted from the time the early lines of the N.A.R. were constructed to approximately 1950, with due allowances made for changes in the general level of rates brought about by increased wages and material costs. It was only during this period that the railway could be said to have had a virtual monopoly on inland transport. True, in the 1930's, truckers had forced the railway to cut many of its rates. However, by comparison to what was to happen later, these reductions were not drastic from the railway's point of view. In the 1940's, the expansion of the trucking industry was retarded by war time restrictions and post war shortages, consequently, it was not until about 1950, that the highway carriers were in full contention for traffic.

Competition between the railway and highway carriers thus has had three main effects. First, it has deprived the railway of traffic. Second, it has reduced rates and fares by rail. Third,

it has introduced or rather emphasized certain neglected aspects of what constitutes good transportation services. Until recently, railroad advancement has been too cost-related, and too little service related to attract a growing volume of freight traffic requiring premium service. As Currie aptly remarked:

> "The numerous differences between road and rail services - rate of technological change, door to door delivery, elimination of transfer between one vehicle and another, frequency of depature, dependability, speed of delivery, and personalized service - all show up in cost and in rates. For many years, railway executives underestimated the importance of all these factors except rates. Therefore, they concentrated on rates as a method of recovering traffic from their competitors." (Currie 1967)

The rate practices of rail transportation in the "north" as elsewhere in Canada, thus tend to produce an artifical and "unnatural" economic geography (Ullman 1956). To a degree, this may well be true, for as we have seen, by charging less than total cost rates for low-value bulk commodities like grain, because of government regulation, and by recovering the difference on higher value commodities like manufactured goods, "the low-value bulk commodities in consequence tend to be moved longer distances, and the higher value commodities shorter distances, than might otherwise be the case." (Penrose 1952).

CHAPTER FOUR

AN ANALYSIS OF SELECTED COMMODITY FLOWS ON THE N.A.R. 1969

Introduction

The Canadian economy of the early 20th Century was shaped by an emphasis on resource extraction, and geared to the expanding industrialism in Europe. "The spread of industrialism in Europe created a demand for Canada's export staples (fur, fish, lumber, and wheat), a source of cheap manufactured goods for Canadian consumption, and a growing volume of capital for investment in Canadian expansion; this, combined with the shrinking export surplus of the United States, laid the foundations for the Canadian economy of today." (Easterbrook & Aitken 1963, 1970). In general design, the Canadian economy s presented few deviations from the pattern of development which had emerged with the fur and timber staples trade of earlier times. It may be summed up as a "national programme expressed in terms of staples and transportation, tariffs and railways...and in the half century following Confederation, had become committed to the achievement and maintenance of a national unity based on staples, railways and tariffs." (Easterbrook & Aitken 1963, 1970).

Northern Alberta was and still is a staples producing region and by exporting raw materials, its economy, as in other parts of Canada, was able to provide a reasonable level of material well-being for its inhabitants and attract the immigrants and capital required for its development. "The most rapid and certain way in which the inhabitants of Canada could improve their standards of living was by exporting staples to the industrially more advanced countries (Britain, Germany, Japan, the U.S.A., to name a few) and importing manufactured goods from them." (Easterbrook & Aitken 1963, 1970). The rise of the great staple trades (fur, fish, timber, wheat) thus created a pattern of development which fostered areas of specialized production of raw materials, thereby compelling spatial interaction. This is reflected in the pattern and flow of commodities into and out of this region.

The aim of this chapter is to analyze the pattern of commodity flows on the Northern Alberta Railway. To facilitate this analysis, the flows of freight traffic have been classified in the following manner (Figure 4.1):

(a) "Outbound" or "Forwarded Traffic" - freight forwarded from points on the N.A.R. and G.S.L.R. to be transferred at Edmonton to Canadian National and Canadian Pacific rail connections, and

(b) "Inbound" or "Received Traffic" - freight received from Canadian National and Canadian Pacific rail connections as well as from Edmonton, to be

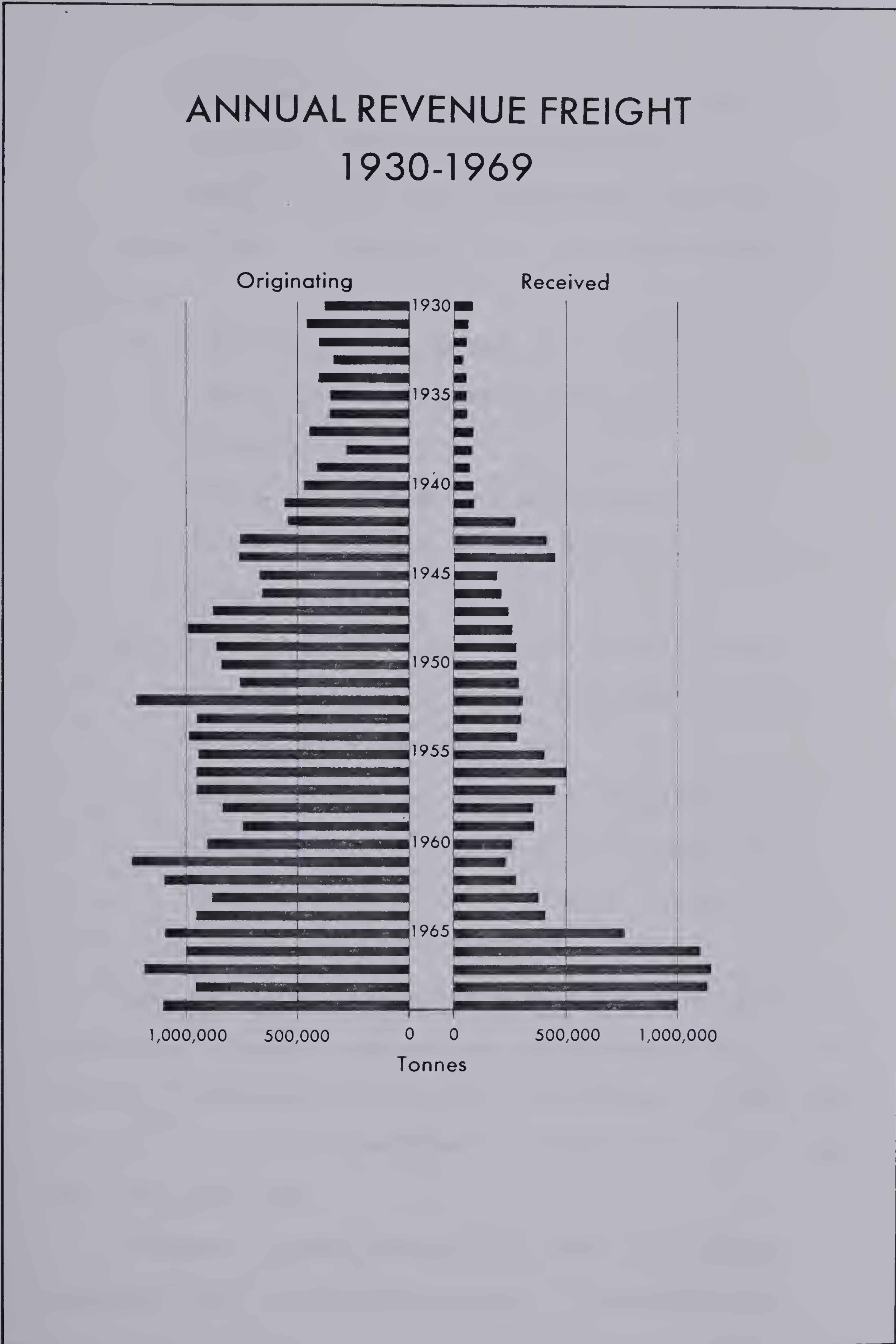

ANNUAL REVENUE FREIGHT
1930-1969
Originating
Received
1930
1935
1940
1945
1950
1955
1960
1965
1,000,000
500,000
0
0
500,000
1,000,000
Tonnes

FIGURE 4.1

terminated on this railroad as well as to other connections like the G.S.L.R. and B.C.R..

In terms of origins and/or destinations, the nature of the freight traffic is composed of four components as shown in Table 4.1.

(i) Traffic originating on this line - the N.A.R., i.e., all traffic originating from stations on the N.A.R. lines,

(ii) Traffic from Canadian rail connections, i.e., all traffic delivered <u>to</u> the N.A.R. by such lines as the G.S.L.R.,

(iii) Traffic terminating on this line - mainly inbound or northbound flow of traffic with goods destined for stations on the N.A.R., and

(iv) Traffic delivered to Canadian rail connections - all traffic delivered by the N.A.R. to other rail lines like C.N.R., C.P.R. and A.R.R. - mainly southbound or outward flow.

Thus, the traffic originating on the N.A.R. line (column 1), together with traffic from other rail connections (column 2), less the traffic terminating on the N.A.R. line (column 3) would result in the amount of traffic delivered to Canadian railways for movement out of the area.

Furthermore, commodities moving on the N.A.R. have been classified into five commodity groups: (i) agriculture and

TABLE 4.1

1969 FREIGHT TRAFFIC TONNAGE IN METRIC TONS

	Originating on N.A.R	From Canadian Rail Connections	Terminating on N.A.R.	To Canadian Rail Connections
J	57,528.9	66,711.6	21,619.8	102,620.7
F	69,168.6	74,128.5	20,856.6	122,440.5
M	92,198.7	89,705.7	21,365.1	160,539.3
A	99,501.3	79,176.6	17,669.7	161,008.2
M	91,239.3	103,562.1	22,549.5	172,251.9
J	104,465.7	98,007.5	16,478.1	186,065.1
J	135,972.0	102,172.5	17,898.3	220,246.2
A	83,465.1	101,304.0	16,608.6	168,160.5
S	94,743.9	76,465.8	12,796.2	158,413.5
O	113,559.3	75,822.3	14,633.1	174,748.5
N	66,372.3	69,946.2	11,896.2	124,422.3
D	96,552.0	68,833.8	12,852.0	152,533.8
	1,104,767.1	1,005,906.6	207,223.2	1,903,450.5

SOURCE: N.A.R. Records

products of agriculture, (ii) animals and products of animals, (iii) products of the mines, (iv) products of the forests, and (v) products of manufacturing and miscellaneous (Table 4.2, Figure 4.2).

This breakdown has been in use on the N.A.R. for quite some time and though modified in the 1970's, is essentially similar to the system used by the Interstate Commerce Commission in the U.S.A. and is generally prevalent throughout North America. In view of the fact that many commodities like lumber, ores, and manufactured goods are forwarded to and received from U.S. rail connections via C.N. and C.P., this uniformity of classification facilitates the maintenance of waybills and the dispersal of freight revenues. In addition, to show the patterns of origin and destination within the N.A.R. system, the rail net has been divided into eight traffic generating and receiving regions which correspond to the eight subdivisions of the N.A.R. (Figure 4.3).

In this chapter, a description and analysis of the patterns of commodity movement during 1969, will be presented and substantiated by relevant flow maps and statistical data. While a large number of variables exert an influence on the nature, volume and the direction of traffic flows on the N.A.R., it must be emphasized that the distribution of population and industries in the regions it serves, the role of competitive modes of transportation, the changes in economic activity and production patterns in the regions served, and the marked difference in the degree and kind of economic activity that exists between the Northwest or

TABLE 4.2

VOLUME OF REVENUE TRAFFIC MOVED ON N.A.R. LINES
BY COMMODITY CLASSIFICATION IN TONNES
1960 - 1969

	Products of Agriculture	Products of Animals	Products of Mines	Products of Forests	Manufactures and Miscellaneous
1960	631618.2	10976.4	88839.0	201346.2	239556.6
1962	736902.9	7867.8	181735.2	225934.2	219607.2
1964	631668.6	2548.8	152085.6	284290.2	296112.6
1966	646361.1	1066.5	736428.6	232583.4	479988.0
1968	645360.3	597.6	737840.7	298571.2	414424.8
1969	748176.8	425.7	612960.3	339542.9	399576.6

SOURCE: N.A.R. Records

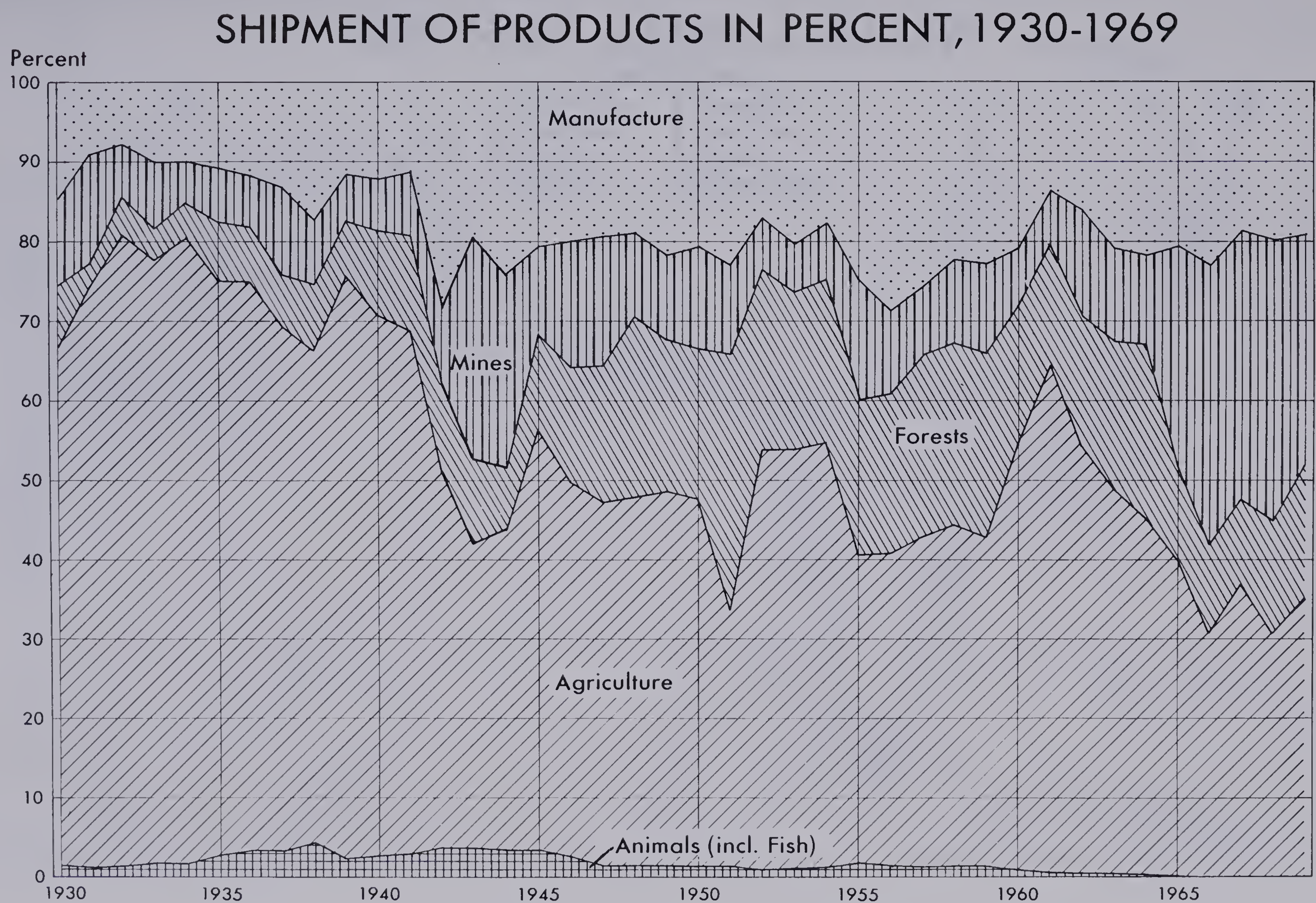

SHIPMENT OF PRODUCTS IN PERCENT, 1930-1969
Percent
100
90
80
70
60
50
40
30
20
10
0
1930
1935
1940
1945
1950
1955
1960
1965
Manufacture
Mines
Forests
Agriculture
Animals (incl. Fish)

FIGURE 4.2

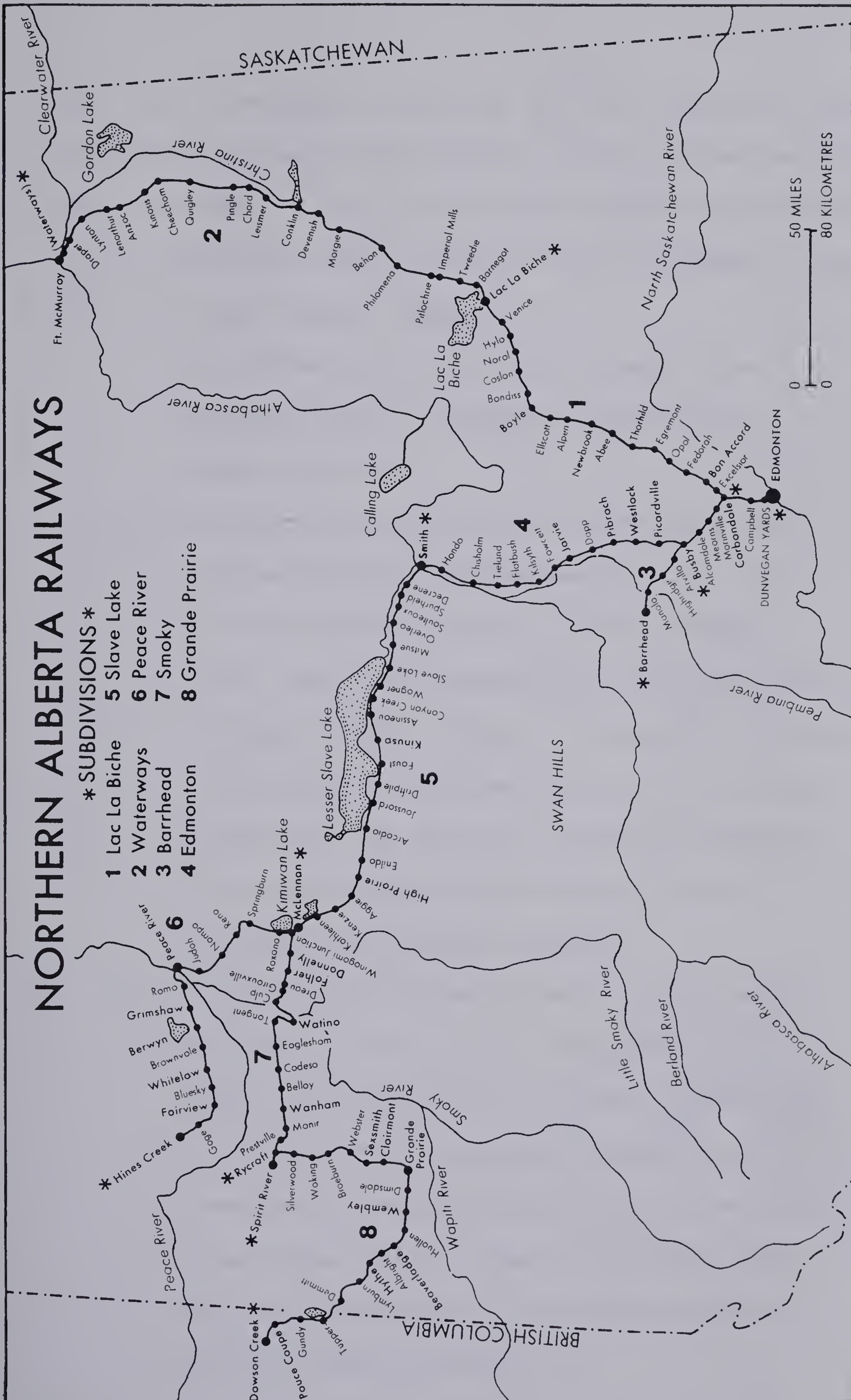

NORTHERN ALBERTA RAILWAYS
* SUBDIVISIONS *
1 Lac La Biche
2 Waterways
3 Barrhead
4 Edmonton
5 Slave Lake
6 Peace River
7 Smoky
8 Grande Prairie
SASKATCHEWAN
BRITISH COLUMBIA
0 50 MILES
0 80 KILOMETRES
EDMONTON
DUNVEGAN YARDS
Lac La Biche
Ft. McMurray (Waterways)
Lesser Slave Lake
SWAN HILLS
Peace River
Grande Prairie
Dawson Creek
Athabasca River
North Saskatchewan River
Smoky River
Wapiti River
Pembina River
Clearwater River
Christina River
Gordon Lake
Calling Lake
Kimiwan Lake
Little Smoky River
Berland River

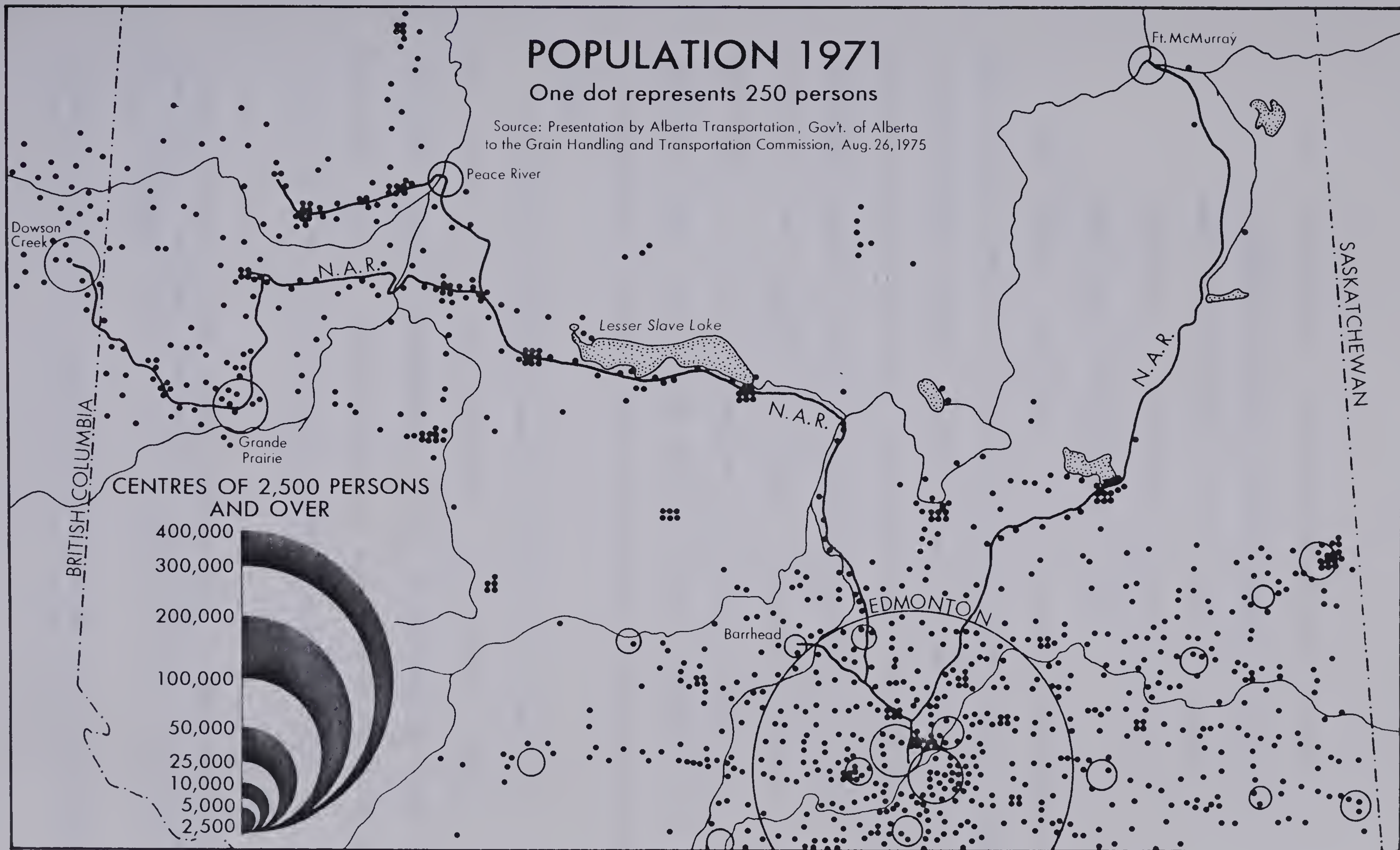
FIGURE 4.3

main line hinterlands of the N.A.R. and the hinterland of the northeast rail line to Fort McMurray, have by far had the greatest impact on commodity flows. All of these factors are illustrated in the volume and pattern of flows during this decade in which there were four dominant trends:

(i) the dominance of outward or southbound flows, composed mainly of products of agriculture, forest and mines,

(ii) the inward movement of manufactured goods which includes machinery and implements of all kinds, building materials as well as a wide range of other items, for a comparatively sparse population (115,000 in 1971), (Figure 4.4) devoted in the main to the primary industries of agriculture, mining, forestry and the tertiary or service industries. This region depends almost entirely on manufactured goods produced elsewhere,

(iii) the increase in the net volume of tonnage being delivered by the G.S.L.R. to the N.A.R. line, which is an indication of the pace of development in the far North. Initially, lead and zinc ores were the only commodities delivered to the N.A.R. line at Roma Junction. However, by 1969, lumber and grain shipments had contributed substantially to this volume of tonnage, and



POPULATION 1971
One dot represents 250 persons
Source: Presentation by Alberta Transportation, Gov't. of Alberta to the Grain Handling and Transportation Commission, Aug. 26, 1975
Ft. McMurray
Peace River
Dowson Creek
Grande Prairie
N.A.R.
Lesser Slave Lake
N.A.R.
N.A.R.
SASKATCHEWAN
BRITISH COLUMBIA
EDMONTON
Barrhead
CENTRES OF 2,500 PERSONS AND OVER
400,000
300,000
200,000
100,000
50,000
25,000
10,000
5,000
2,500

FIGURE 4.7

(iv) the increase in the volume of traffic on the northeast line with the development of the Oil Sands at Fort McMurray and in particular, the construction of the Great Canadian Oil Sands plant which was completed in 1967.

From Table 4.1 and Figure 4.1, it is obvious that the N.A.R. can be classified as an "Originating Railroad"*, since "It serves a comparatively sparsely peopled region, but generates large amounts of grain and lumber." (Wallace 1963). A better classification, however, would be "Orginating Bridge"**, a classification term suggested by Wallace. This classification is more applicable to the N.A.R. when one considers that since its inception in 1964, the G.S.L.R. has delivered a substantial volume of annual traffic to the N.A.R. for movement to the C.N. and C.P. lines.

Of the total tonnage moved in 1969, grain, lumber, and lead and zinc ores and their concentrates, accounted for the bulk of the total tonnage of forwarded traffic, while chemical fertilizer, petroleum products, and miscellaneous manufactures totalled over 350,864 tons for received traffic (Tables 4.3 and 4.4).

---

*Classification as used by the Anglo-American Interstate Commerce Commission. The four classes are: (i) Internal or Local Traffic, (ii) Originated Traffic, (iii) Terminated Traffic, and (iv) Bridge Traffic.

**Classification term suggested by William Wallace in Freight Traffic Functions of Anglo-American Railroads, page 330.

TABLE 4.3

FORWARDED REVENUE TRAFFIC ON N.A.R.
SOUTHBOUND OR OUTWARD MOVEMENT OF LEADING COMMODITIES 1969

Commodity	In Cars	In Tonnes
PRODUCTS OF AGRICULTURE		
Grain (wheat, oats, barley)	13973	
Seeds (rape, flax)	472	
TOTAL PRODUCTS OF AGRICULTURE	14445	748171.8
PRODUCTS OF FORESTS		
Plywood	6885	
Pulpwood	107	
Logs	1365	
Lumber	202	
TOTAL PRODUCTS OF FORESTS	8559	349542.9
PRODUCTS OF MINES		
Lead and Zinc (Ores & Concentrates)	6958	
Coal	203	
Sulphur	297	
Crude Oil	450	
Condensate	109	
L.P.G.	140	
TOTAL PRODUCTS OF MINES	8157	612960.3
PRODUCTS OF ANIMALS		
Livestock	--	
Fish	24	
TOTAL PRODUCTS OF ANIMALS	24	425.7

SOURCE: N.A.R. RECORDS & SCHEDULE 35 - SHEETS 1-14

TABLE 4.4

RECEIVED REVENUE TRAFFIC N.A.R.
NORTHBOUND OR INWARD MOVEMENT OF
LEADING COMMODITIES 1969

Commodity	In Cars	In Tonnes
MANUFACTURES AND MISC.		
Petroleum & Petrol Products	4186	264470.4
Fertilizer & Chemicals	935	36685.0
Iron & Steel Pipe	529	18533.0
Cement	470	18432.0
Building Materials	592	14520.6
Machinery & Implements	548	12560.0
Food, Beverages, Paper & Paper Goods, & Miscellaneous Goods	1081	34375.6
TOTAL MANUFACTURES AND MISC.	8341	399576.6

SOURCE: N.A.R. Records & Schedule 35, Sheets 1-14

From Table 4.3, it is evident that grain, lumber, and lead and zinc ores are predominant in the southbound flows, with each of them ranking at the top of the list within their commodity groups. It is evident also that there is virtually no movement of livestock by rail as all of this tonnage is now moved by truck. Only a few hundred tonnes of fish from the Lesser Slave Lake regions are carried in the refrigerated cars of the N.A.R., and here again, road transport is gradually capturing this traffic. And while a large number of items in the last commodity group - manufactures and miscellaneous - are moved into Northern Alberta, and are substantial on occasion (like cement or steel pipes, or machinery and heavy equipment), two bulk commodities are continuously prominent - petroleum and petroleum products and chemicals and fertilizer (Table 4.4).

Thus, the patterns and flows of each of these major commodities which generate the most tonnage for the N.A.R., do warrant study inasmuch as they comprise a great deal of the spatial interaction of commodities within Northern Alberta.

Agricultural Products: Grain

Agriculture is the commodity group which provided the incentive for the construction of the present N.A.R. main line running northwest from Edmonton and since then, it has been one of the leading originators of traffic from the grain-growing lands of the Peace River region. The grain group includes barley, buckwheat, flaxseed, grain seed, oats, rye, rapeseed and wheat.

The total volume of agricultural products moved on the N.A.R. lines in 1969, amounted to 748,171.8 tonnes (831,302 short tons), of which grain accounted for 743,661.9 tonnes (826,291 short tons), (Tables 4.5 and 4.6); of this amount, 691,979.4 tonnes (768,866 short tons) originated on the N.A.R. lines, with most of the remainder having been delivered to the N.A.R. by the Great Slave Lake Railway (Brown 1971).

From Table 4.7, which indicates the grain generating subdivisions, it is evident that there is an absence of grain pick-up on the Lac La Biche-Fort McMurray Subdivision 2, suggesting the virtual absence of agricultural activity in the hinterlands of that line. Nearly 75% of the total grain traffic originating on the N.A.R. lines is generated from the Peace River Country which extends westward from High Prairie. This is reflected in the grain originations in the Grande Prairie Subdivision Number 6, and the Slave Lake Subdivision Number 5. The bulk of the grain from Subdivision 5 is generated from the High Prairie-Valleyview-McLennan sector since farming activities are rather "patchy" along the shore of the Lesser Slave Lake between Enilda and Smith. The other region of fairly intensive mixed farming is the Edmonton-Westlock-Fawcett sector and this is evident in the amount of grain pick-up in Subdivision 4. Grain from the Barrhead region, Subdidivision 3, amounted to 28,754 tonnes and the Carbondale-Lac La Biche region, Subdivision 1, yielded 39,228 tonnes in 1969 (Figures 4.5 & 4.6).

TABLE 4.5

GRAIN TRAFFIC ON N.A.R. 1969

Grain	Originating from N.A.R. Stations		Delivered to N.A.R. (at Roma Junction) by G.S.L.R. in Tonnes	TOTAL IN TONNES
	In Tonnes	In Cars		
Wheat	212,546.7	4,066	19,886.4	232,433.1
Oats	30,861.9	667	894.6	31,756.5
Barley	326,484.9	6,538	22,203.9	348,688.8
Rye	1,584.9	35	50.4	1,635.3
Flaxseed	15,124.5	314	1,260.9	16,385.4
Rapeseed	104,177.7	2,324	7,008.3	111,186.0
Grain Seed	1,198.8	29	378.0	1,576.8
TOTAL IN TONNES	691,979.4	13,973	51,682.5	743,661.9

SOURCE: N.A.R. Records, Schedule 35

TABLE 4.6

VOLUME OF AGRICULTURAL PRODUCTS MOVED ON THE N.A.R. LINES IN TONNES: 1969

Volume of Grain Originating on N.A.R. lines	691,979.4
Volume of Grain Delivered to N.A.R. from G.S.L.R.	51,682.5
Volume of Grain on N.A.R. lines	743,661.1
Volume of Grain Products Terminated on N.A.R. Lines (Flour and the Mill Products)	4,509.9
TOTAL VOLUME OF AGRICULTURAL PRODUCTS MOVED ON N.A.R. LINES	748,171.8

SOURCE: N.A.R. Records, Schedule 35

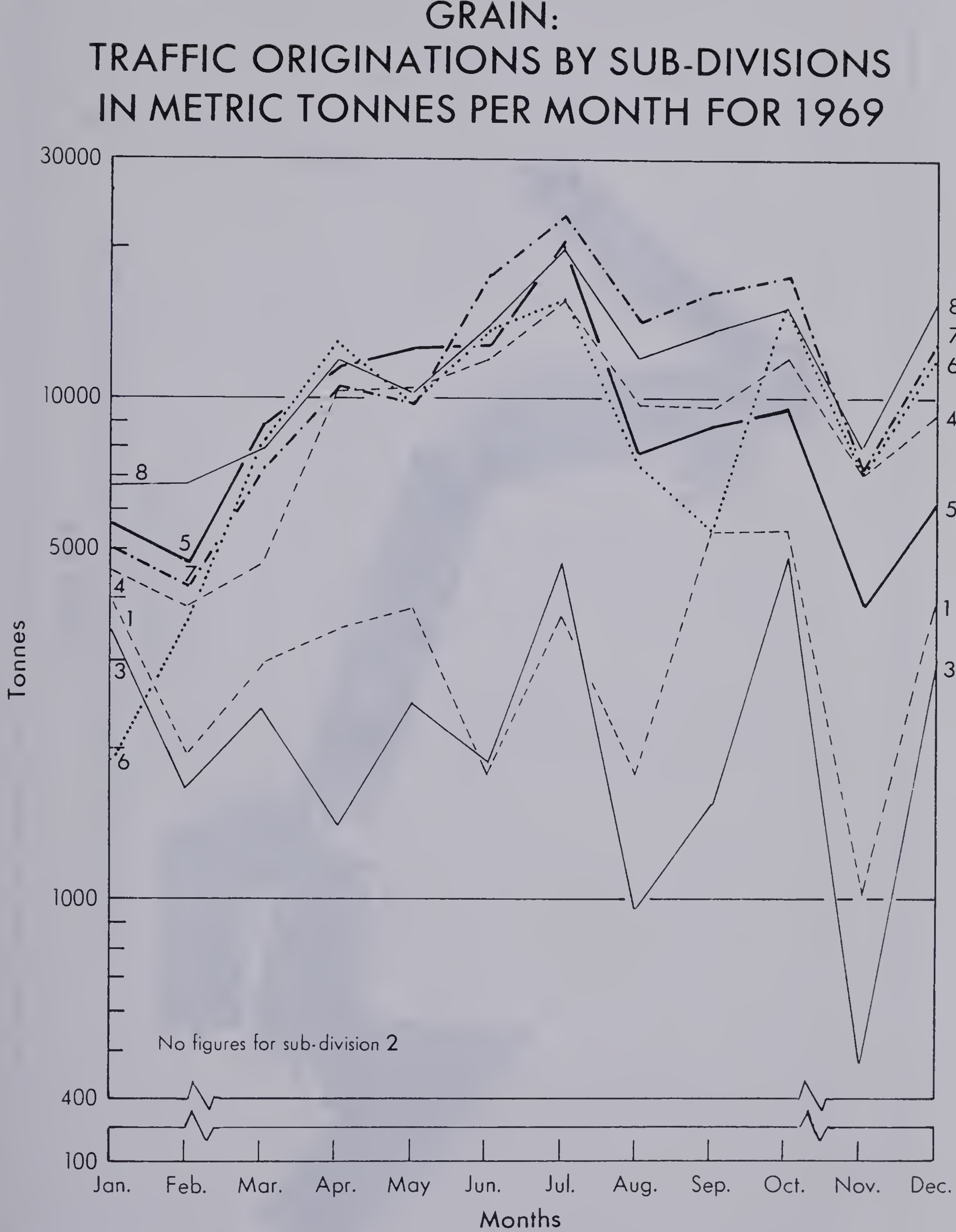

GRAIN:
TRAFFIC ORIGINATIONS BY SUB-DIVISIONS
IN METRIC TONNES PER MONTH FOR 1969
30000
10000
5000
1000
400
100
Tonnes
8
5
7
4
1
3
6
8
7
6
4
5
1
3
Sub-divisions
No figures for sub-division 2
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
Months

FIGURE 4.5

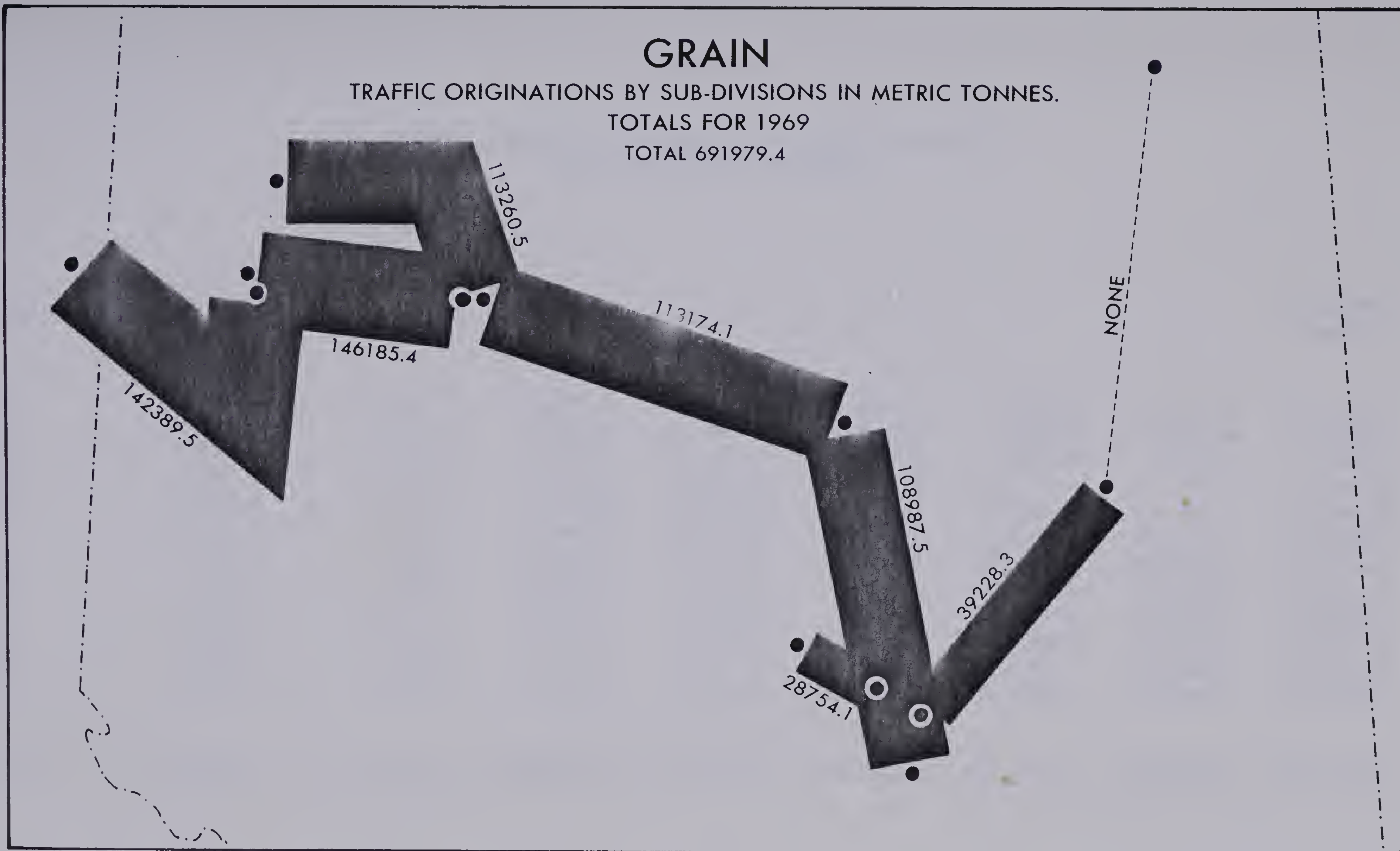

GRAIN
TRAFFIC ORIGINATIONS BY SUB-DIVISIONS IN METRIC TONNES.
TOTALS FOR 1969
TOTAL 691979.4
113260.5
146185.4
142389.5
113174.1
108987.5
39228.3
28754.1
NONE

FIGURE 4.6

TABLE 4.7

GRAIN: TRAFFIC ORIGINATIONS BY SUBDIVISIONS IN TONNES PER MONTH FOR 1969

Subdivisions	1	2	3	4	5	6	7	8	Total Per Month
JAN.	3,964.5	-	3,460.5	4,589.1	5,610.6	1,894.5	5,019.3	6,764.4	31,302.9
FEB.	1,953.0	-	1,639.8	3,876.3	4,745.7	3,610.8	4,269.6	6,773.4	26,868.6
MAR.	2,957.4	-	2,396.7	4,654.8	8,878.5	8,267.4	7,322.4	7,920.0	42,397.2
APR.	3,489.3	-	1,393.2	10,106.0	11,732.4	12,911.4	10,556.1	11,919.2	62,207.6
MAY	3,842.1	-	2,451.6	10,417.6	12,672.9	9,836.1	9,776.0	10,395.9	59,392.2
JUN.	1,771.2	-	1,860.3	11,945.7	12,816.9	13,482.0	17,641.0	14,071.5	73,589.4
JUL.	3,702.6	-	4,723.2	15,663.6	20,544.3	15,670.8	23,064.3	20,065.5	103,434.3
AUG.	1,773.0	-	963.0	9,696.7	7,774.2	7,408.8	14,187.6	12,063.6	53,866.9
SEP.	5,378.4	-	1,550.7	9,621.0	8,703.0	5,462.1	16,233.3	13,671.0	60,619.5
OCT.	5,476.5	-	4,817.7	11,985.3	9,510.3	15,381.9	17,892.9	15,030.0	80,031.6
NOV.	1,026.0	-	471.6	7,029.0	3,918.0	7,089.3	7,257.6	8,066.7	34,858.8
DEC.	3,894.3	-	3,025.8	9,302.4	6,266.7	12,308.4	12,964.5	15,648.3	63,410.4
TOTAL	39,228.3	-	28,754.1	108,987.5	113,174.1	113,260.5	146,185.4	142,389.5	691,979.4

Seasonality of the grain movement is also reflected in Figure 4.5 and Table 4.7. There is a general peaking between the months of June and October, and provided that elevator storage problems do not arise, efforts are made to even out the grain flow throughout the year, thus ensuring enough traffic to warrant train load movements on the lines at all times. This minimizes "grain traffic bottle necks" at collection points. Further, the N.A.R.'s system of renting boxcars for grain shipment makes it essential that cars are requisitioned on time in order to avoid delays, which can and do occur from time to time.

It is pertinent to state at this juncture that in 1969, the N.A.R. requested fifteen new "hopper" cars per day to handle the ever increasing shipments of grain moving on the lines. These were finally made available by the parent companies in the mid seventies. Each hopper car is equipped with roof hatches and four discharge gates and has a 128.8 cubic metres (4550 cubic feet) capacity (Plate 4.1).

In spite of these measures, many grain shippers complain that there are unnecessary delays in grain reaching the terminals. Shippers charge that the railways are deliberately keeping the supply of boxcars for grain in short supply and point out the numerous empty and idle boxcars at various railway sidings. They also accuse the railway of discriminatory practices by pointing to the fact that there is never any delay for cars when shipments for lumber or mineral ores have to be made. It is possible

PLATE 4.1: Government Grain Hopper Cars Alongside Elevators at Falher

that these accusations are true because revenues derived from lumber and mineral ore traffic are profitable to the railway. Grain traffic is not, according to the railway, since grain for export is charged a rate based on the Crowsnest Pass Agreement* of 1897, amended in 1925, and by Order 36769, and confirmed by the Transportation Act of 1967.

While the volume of grain dispatched has been on the increase since the inception of the N.A.R., the statutory rates charged for the movement of this commodity for export have not been compensatory in recent decades. In other words, the charges have been insufficient to cover out-of-pocket expenses incurred by the railway in moving this commodity. Grain for domestic use is charged a higher rate and has been subjected to the usual rate increases as other commodities and is considered fully compensatory by the Railway. Similarly, flaxseed and rapeseed are charged 1 1/2 cents higher per 45.36 kg (100 lb) than wheat, oats, barley, and other grains. Thus, the railway charges two separate rates for the same commodity: (i) An export rate, based on the amended Crowsnest Pass Rates to cover all grains for export, and (ii) A domestic rate, which is charged for all grain that is

---

*Crowsnest Pass Agreement 1897. Signed Agreement between the Canadian Pacific Railway and the Dominion Government of Canada. In brief, for a cash subsidy and the permission to construct a rail line from Lethbridge through the Crowsnest Pass to Nelson, B.C., the Canadian Pacific Railway reduced the freight rates by 3 cents per 45.36 kg (100 lb) of the then existing rate on the chief export of the region - grain, and on settlers requirements inbound: the concessions were made with no time limit.

used within Canada for milling products or for feeding livestock. The following table (4.8) shows the rate charged per 45.36 kg (100 lb) of wheat for export and the rate charged on wheat used for domestic purposes. These are selected stations on the N.A.R. taken from a complete list in the Appendix.

The 1897 Agreement applied to grain and grain products moving to the Lakehead (Thunder Bay) region, whether they were for export or for domestic use. Thus, grain moving west to Vancouver for making bread or for feeding livestock and poultry was charged the higher domestic rates. Of course, domestic rates applied to western grain moving east of the Lakehead for domestic use. On a mile for mile basis, therefore, the rate on western grain consumed in Eastern Canada is less than the rate on domestic grain used in Vancouver. This situation has arisen because for quite a substantial part of the total haul, that is, from a point of origin on the Prairies to the Lakehead, the grain moves at the low statutory rates. Grain used in Vancouver incurs the domestic rates for the entire haul - these rates having been subjected to all post-war increases and consequently, higher. A diagramatic representation of domestic and export rates from selected stations on the N.A.R. to Vancouver is shown in Figure 4.7.

National policy has recognized the importance of Prairie wheat (which includes the Peace River wheat producing belt) to the Canadian economy. In his study of statutory grain rates on behalf of the 1961 Royal Commission on Transportation, Reid (1960) stated

TABLE 4.8

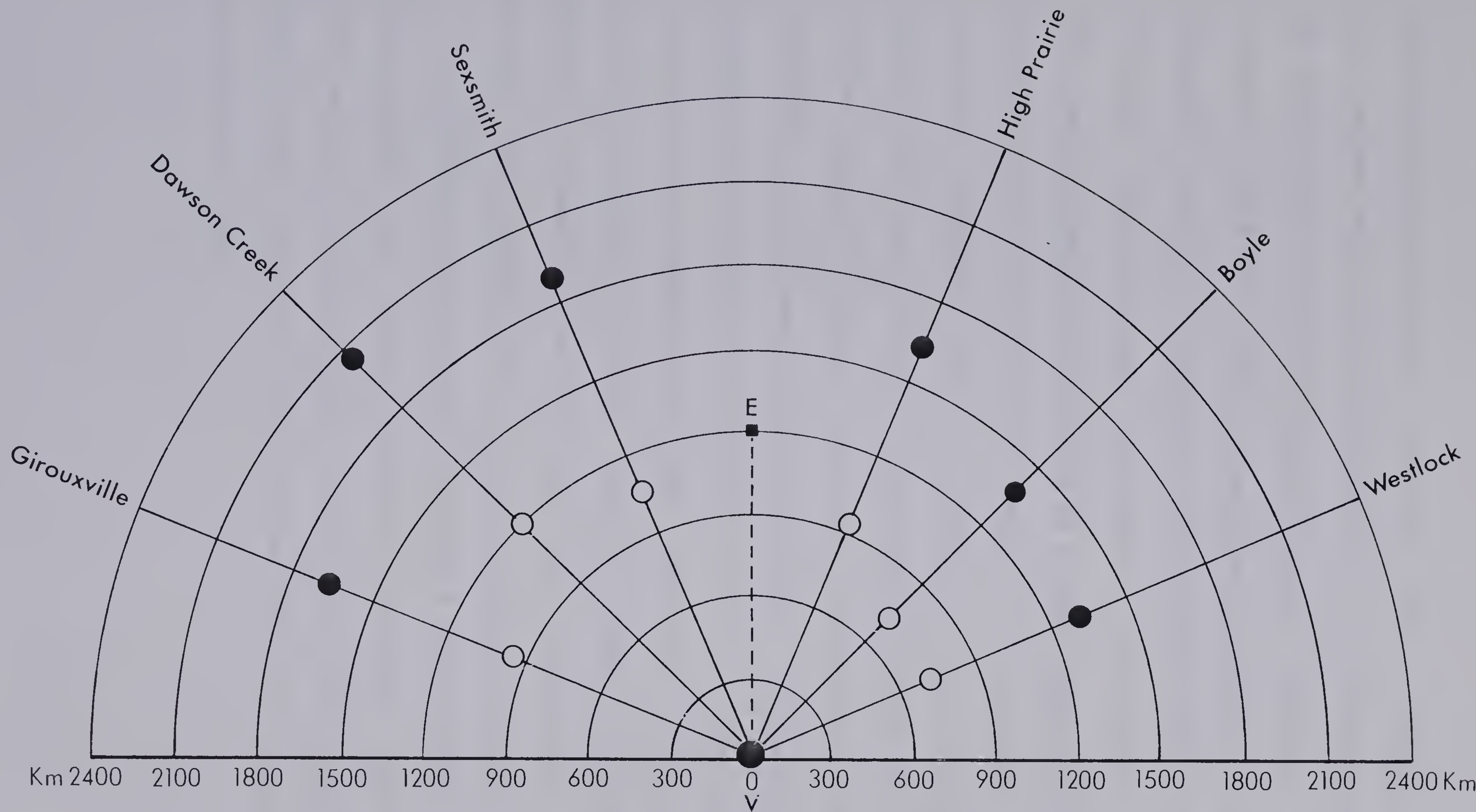
SPECIAL RATES IN CENTS PER 45.36 KG (100 LBS) ON GRAIN FOR EXPORT UNDER THE CROWSNEST PASS AGREEMENT

	(Fort William Thunder Bay)		Vancouver Export		Vancouver Domestic			
	Divisions		Divisions		Divisions			
	Thru Rate	C.N. C.P.	Thru Rate	C.N. C.P.	Thru Rate	C.N. C.P.	Miles Thru	Kms Thru
Barrhead	29.0	6.5	23.0	5.5	41.5	23.5	66.2	90
Beaverlodge	37.0	14.0	29.0	12.5	48.5	43.5	435.7	701
Boyle	29.0	6.5	22.0	6.0	41.5	27.0	91.7	148
Dawson Creek	38.0	15.0	30.0	13.5	50.5	45.0	495.2	797
Enilda	32.0	9.5	25.0	9.0	44.5	35.0	231.9	373
Falher	33.0	10.5	26.0	10.0	45.5	38.0	278.8	449
Girouxville	33.0	10.5	26.0	10.0	45.5	38.0	284.4	457.5
Grande Prairie	35.5	13.0	28.0	12.0	48.0	42.5	406.9	655
High Prairie	32.0	10.0	25.0	9.0	44.5	35.0	239.2	384.5
Hines Creek	35.0	13.0	27.0	11.0	48.0	41.0	381.8	615
Lac La Biche	29.5	7.5	23.0	7.0	42.0	30.0	132.3	212.5
Peace River	33.5	11.5	26.0	10.5	46.0	39.5	317.0	510
Sexsmith	35.5	13.0	27.0	11.5	48.0	42.5	393.3	633
Spirit River	34.5	12.0	26.0	10.5	47.0	40.5	362.2	583
Westlock	28.0	5.5	22.0	5.0	41.5	22.5	57.2	92

SOURCE: N.A.R. Records

EXPORT AND DOMESTIC RATES: 1969-1970

GRAIN



● Actual rail distance of towns from Vancouver based on 'export' rates
○ Rail distance of towns from Vancouver based on 'domestic' rates
E--V Actual rail distance from Edmonton to Vancouver

FIGURE 4.7

that the Crowsnest Pass rates had their origin in national policy at a time when this policy promulgated as very prominent elements, the stimulation of agriculture and settlement of the West. Grain produced on the Prairie has to be exported because of low domestic consumption, and only an <u>efficient</u> and <u>economical</u> mode of transportation, like the railway, could keep the grain farmer in business. But the comparative rigidity of a rate based on the cost of moving grain to a competitive world market would compound the severity of financial losses to the Canadian Prairie farmer whose income, at the best of times, is very unstable due to the vagaries of Western Canada's climatic conditions, and the uncertainity of world market demands and prices (Currie 1967). Furthermore, Canadian Prairie farmers are the most distant from cheap ocean transportation as compared with their competitors in Argentina, Australia, India and the U.S.A.. Bearing in mind all of these factors, the Canadian Government negotiated and signed the Crowsnest Pass Agreement with the Canadian Pacific Railway.

The Crowsnest Pass Agreement was thus a manifestation of National policy for it was felt that on the one hand, the transportation of grain would enhance the business of the railway (which it did), and at the same time, the statutory rates would serve the public good.

In the words of Professor Currie:

> "Freight rates on grain exported from Western Canada would be important in Canadian transportation even though Parliament never passed a statute that directly affected them.... When our policy on freight rates was being formulated, it (grain) was the basis of the entire area." (Currie 1967)

There is no disputing the fact that the Crowsnest Pass rates have had a stimulating effect on settlement and agricultural production (particularly, that of wheat and other grains) on the prairies, since the net return to producers has been higher than it would otherwise have been. For through a time when all other costs of production have risen, the Crowsnest Pass rates have maintained one variable cost component at an uninflated level. Furthermore, these statutory rates undoubtedly have provided producers a relatively competitive access to international grain markets.

As has been mentioned, the N.A.R. has quite categorically stated that the statutory rates on grain for export are not compensatory. The C.P.R., after a fairly extensive study, claimed that in 1948, these statutory rates did not cover out-of-pocket expenses, and in fact, resulted in a loss of between $13.8 million and $16.9 million dollars (Royal Commission on Transportation 1951). Mr. Justice Sloan seemed to concur with C.P.R.'s analysis in his report in 1952. On the contrary, the C.N.R. feels that "the question of the profitability of grain moved under the Crowsnest

Pass rates can be established only by a very detailed cost analysis." Donald Gordon, the President of the C.N.R. went on to say that, "at...a given volume of wheat (movement) we would lose money, but as that volume increases, we get a contribution to our overhead costs which would eliminate or reduce any losses." Earlier, S. W. Fairweather, an economist for the C.N.R., had stated that, "a reasonable average crop of about (400 million bushels) 10,888,000 metric tons should give an increase in net revenue of about $12 million over a crop failure (165 million bushels) 4,491,300 metric tons, while a bumper crop of about (560 million bushels) 15,243,000 metric tons would net a profit of $20 million." (Currie 1948). It seems reasonable to suppose, therefore, that not only was there some uncertainty as to whether the Crowsnest rates are compensatory or not, but that there is a relationship between the volume of grain shipped and the amount of contribution to overhead costs. This would indicate, therefore, that the amount of subsidy paid varies directly with the producers needs in any particular year.

While the relatively low Crowsnest rates have stimulated the large scale production of grain for export, they have also indirectly contributed to higher freight rate charges on other commodities such as mineral ores, lumber, and heavy manufactured goods. Rate increases allowed by the Board of Transport since World War II have taken cognizance of the revenue needs of the railways and the existence of the statutory rates on grain. Thus,

greater rate increases were granted, than would have been the case if all traffic, including grain, were subject to general rate increases. It may also be concluded from this, that the railways have lost much traffic on certain lines to trucks which have been able to move those items at a cheaper rate, but could also offer speed, flexibility, and regularity of service as well. In other words, statutory rates have indirectly been the cause of freight rate increases falling very heavily on a small select range of commodities. Ironically enough, the agricultural shipper who seems to benefit from the low rail rate on his commodity, loses this on the high cost of goods imported into the region. Of course, the non-agricultural shipper and all other sectors of the public too, in fact, have to pay higher freight costs on all other goods moved into the region by rail. While trucks compete for this traffic, it must be remembered that trucks use the railways' published rate as a "base" for an "agreed" charge to move goods in or out of the region. This published rate is higher than what it might have been as had been mentioned previously.

Forest Products: Lumber

For many decades, the forest industry has played a prominent role in the economy of Northern Alberta. Until 1960, the industry was characterised by fairly small, often portable sawmills and planers which operated only during the winter, but since then, centralized and permanent sawmills have been established as

logging practices have changed substantially. The introduction of wheeled skidders, large logging trucks and the economies of scale associated with large mills have resulted in large tree-logging operations.

For several years, large amounts of timber have been cut and are still being cut from the excellent Forest Management Units of the Lesser Slave Lake, Grande Prairie, Peace River and Lac La Biche forests. These forests produce some of the good commercial woods, particularly, White Spruce, Black Spruce, Pine, Balsam Fir, and Poplar. Cutting rights are granted by the Provincial Department of Lands and Forests under a quota system for sawn timber and by lease for plywood. Selective cutting and re-forestation ensures that the forests are maintained to perpetuity. A high percentage of the lumber produced is exported to the U.S.A.. In 1965, 80% of the 2,433 carloads of lumber from the Northwestern region were moved to various destinations in the United States (Plates 4.2 to 4.5).

Lumber falls into the category of forest products and is divided into six categories for rate purposes:

(a) Logs, butts, and bolts (18,144 kg - 27,216 kg minimum),

(b) Posts, poles, piling, props,

(c) Pulpwood,

(d) Lumber, shingles, lath,

(e) Veneer, plywood and built-up-wood, and

(f) Cordwood, sawdust, shavings slabs (min. wt. 30,000 lb - 45,00 lb; 16,330 - 20,412 kg).

PLATE 4.2: Log Piles Ready for the Sawmills

PLATE 4.3: Old Imperial Lumber Mill at Grande Prairie

PLATE 4.4: Loading Sawn Lumber on Open Top Rail Car

PLATE 4.5: Rail Cars with Lumber Shipped to the U.S.A.

Of the total volume of 340,318 tonnes of lumber products (388,381 tons) which moved on the N.A.R. in 1969, 297,318 tonnes (330,353 tons) were generated along the N.A.R. route chiefly from Subdivisions 5, 6 and 8 (Figure 4.8). The bulk of the remaining tonnage was delivered to the N.A.R. lines by the G.S.L.R. from Alberta's largest sawmill at High Level.

Nearly 85% of all the lumber moved on the N.A.R. moves to Eastern Canada and the U.S.A.. The N.A.R. charges a rate based on mileage from the point of origin to Edmonton. From there, U.S.A. coastal rates* are applied by the C.N. and C.P. Railways. Thus, the rate from Westlock to Edmonton for logs and bolts would be 17 cents per 45.36 kg (100 lb) for a minimum carload weight of 18,144 kg (40,000 lb) while another rate would be applied from Edmonton to point of destination. These are "incentive" rates to encourage heavy loadings, and because straight mileage rates would be much higher.

It is interesting to note that apart from Subdivision 8 (Rycroft-Dawson Creek), Subdivisions 5 and 6 are both large generators of lumber and lumber products (Table 4.9). The hinterland of Subdivision 7 is well settled agricultural land, which was cleared of timber stands during the early days of settlement.

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*U.S. West Coast rate as from the states of Washington and Oregon. These rates are applied in order to compete with lumber shipments from these two N.W. states which are among the U.S.A.'s largest shippers of lumber and forest products.

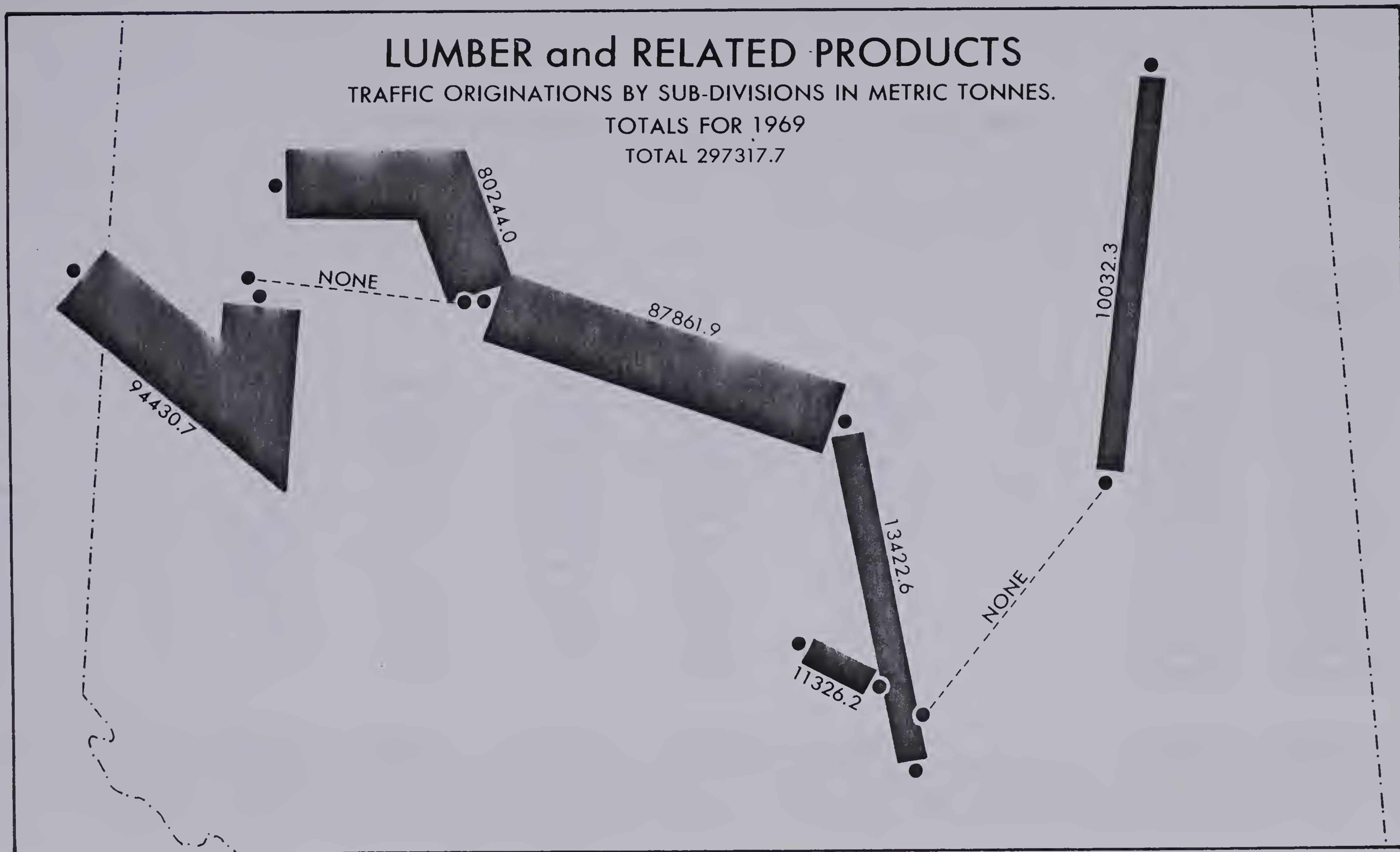
LUMBER and RELATED PRODUCTS
TRAFFIC ORIGINATIONS BY SUB-DIVISIONS IN METRIC TONNES.
TOTALS FOR 1969
TOTAL 297317.7
80244.0
NONE
94430.7
87861.9
13422.6
11326.2
NONE
10032.3

FIGURE 4.8

TABLE 4.9

TRAFFIC ORIGINATIONS BY SUBDIVISIONS IN LUMBER AND RELATED PRODUCTS: TONNES PER MONTH FOR 1969

Subdivisions	1	2	3	4	5	6	7	8	Total Per Month
JAN.	-	264.7	2,392.2	342.0	6,194.7	6,302.7	-	4,347.0	19,743.3
FEB.	-	502.2	2,137.5	1,314.0	10,626.3	11,085.3	-	6,363.0	32,028.3
MAR.	-	851.4	2,853.0	1,740.6	10,462.5	14,013.9	-	8,410.5	38,331.9
APR.	-	463.5	2,513.7	1,009.2	10,015.2	11,597.4	-	7,896.6	33,469.2
MAY	-	171.9	-	598.5	11,841.3	3,456.9	-	8,435.7	24,504.3
JUN.	-	1,458.9	-	1,748.7	8,943.3	4,019.4	-	5,532.3	21,738.6
JUL.	-	2,044.8	-	2,382.3	10,464.3	3,428.1	-	6,347.7	24,667.2
AUG.	-	2,047.5	-	2,400.3	8,639.1	2,429.1	-	6,388.2	21,904.2
SEP.	-	1,271.7	192.3	1,070.1	3,300.3	5,686.2	-	10,007.1	21,530.7
OCT.	-	984.6	540.9	380.7	3,047.4	5,274.0	-	10,098.9	20,326.5
NOV.	-	71.1	472.5	399.6	2,750.4	7,042.5	-	9,724.5	20,460.6
DEC.	-	-	224.1	-	1,574.1	5,908.5	-	10,906.2	18,612.9
TOTAL	-	10,032.3	11,326.2	13,442.6	87,861.9	90,244.0	-	94,430.7	297,327.7

SOURCE: N.A.R. Records, Schedule 35, Sheets 5 and 6

The soils are ideal for grain growing and farming activities in the Peace are concentrated here. This accounts in part, for the lack of lumber generation from this region. The bulk of the lumber generated from Subdivision 8, the Grande Prairie region, which is also a large generator of grain traffic, comes from the regions northwest of Grande Prairie which is a vast lumber producing region. This region supplies the vast Proctor and Gamble lumber complex at Grande Prairie which accounts for the substantial quantities of lumber and lumber products generated on this part of the N.A.R. line. However, almost all of the finished lumber products from the Proctor and Gamble complex moves southward via the Alberta Resources Railway.

For many years, large amounts of timber from the forested areas in the vicinity of Subdivision I (Carbondale-Lac La Biche) and 7 (McLennan-Spirit River), which were near enough to the N.A.R.'s divisional headquarters at McLennan and Edmonton, were used for fuel, buildings, and for the construction of the railway track. The present areas of concentration (Slave Lake Forest, Peace River Forest and Grande Prairie Forest) also made their contributions to railway building and maintenance but in no way near the scope of current lumbering activities. Recently, with the advent of the G.S.L. Railway, the Footner Lake Forest and other Forest Management Units further to the north, have become the scene of localized timber cutting and sawmill operations. Nearly 50% of the total wood inventory in Northern Alberta is

composed of five stands of poplar which have increased in importance in recent years with its widespread use as a residential construction material. The remaining timber cut is mainly from commercial stands of white spruce, black spruce, pine and balsam fir.

Timber which is cut from almost all of the forests in Northern Alberta is generally finished or semi-finished prior to being exported from the region. In 1969, there were 81 sawmills and 21 planer mills mostly located at or near the railway lines (Table 4.10). Five of the sawmills and three planer mills are located on the G.S.L.R. route which connects the N.A.R. line at Roma. The sawmills prepare the cut timber for the planer plants which produce the smooth lumber for shipment. Some of these mills are sawmill-planer mill complexes as the ones at High Level, Grande Prairie, and Fort McMurray, the latter having gone into production in 1970, servicing the cut timber from the Wood Buffalo Forest. In contrast, sawn lumber from the plant at Lac La Biche is moved to Edmonton for planing.

Mineral Products

Northern Alberta is part of the Interior Plains that extend from the Canadian Shield to the Rocky Mountains. It is a continental depression of sedimentary rock beneath which lies large reserves of petroleum, natural gas and some coal. While this makes Northern Alberta one of the largest oil and gas storehouses

TABLE 4.10

SAWMILLS AND PLANER MILLS OPERATION IN NORTHERN ALBERTA 1969 ((000) F.B.M.)

Forest	Sawmills	Total Lumber Production	No. of Planer Mills & Location	Planed Production For Export
Footner	6	27,000	2 High Level, Keg River	23,000
Grande Prairie	13	79,000	5 Grande Prairie Bezanson, Demmitt	57,900
Peace River	12	37,000	9 Dixonville, Hines Creek, Fairview, Grimshaw	35,000
Slave Lake	35	59,000	5 High Prairie, Enilda, Kinuso, Slave Lake, Chisholm	35,400
Lac La Biche	6	9,000		
Wood Buffalo		18,000		15,000

SOURCE: Department of Lands and Forests, Annual Reports 1949-1969

In addition to the Saw and Planer Mills, there are two plywood plants in the region of Grande Prairie and Enilda and a Pulp and Paper Mill (Proctor and Gamble) at Grande Prairie.

in the nation, this type of geological structure is not conducive to harbouring metallic minerals. However, the presence of iron ore at Worsley in the Clear Hills region near Hines Creek and the recent discoveries of lead and zinc deposits at Pine Point, and gold at Yellowknife, indicate the possible existence of other metallic ores and suggests that beneath the shallow sedimentary cover are intrusions of the Pre-Cambrian Shield of the northeast; recent explorations there have revealed deposits of uranium and molybdenite.

In 1953, traces of iron found in oilwell drilling cores led to the discovery of the iron deposits in the Clear Hills region. Peace River Mining and Smelting has established a reserve of 225 million tonnes of stripable ore, with a probable reserve of another 50 to 75 million tonnes. Only the very near surface ores have been mined so far, which is reflected in the limited flows on the N.A.R.. The complex metalurgical process involved in the extraction process has retarded development and export of these ores on a large scale.

Bentonite and clay which are used extensively for oil drilling operations and bleaching agents, as well as gypsum and silica sand, which are used in glass making and fiberglass, are extracted at Peace River and Fort McMurray. Barytes and salt, vast quantities of which underlie the surface cover, and sulphur, together with sand, gravel, and limestone, among others, are being

extracted in small quantities and are reflected in the originating traffic on the N.A.R..

Northwestern Alberta is endowed with fairly large reserves of coal, the availability of which was an asset to the operation of the railway during the early years when steam was the source of motive power, and the vast coal stacks at various railway stations were a familiar sight, particularly, at the divisions points - Smith, Lac La Biche, McLennan, and Grande Prairie. While some of this coal was acquired from the fields at Sexsmith, Halcourt, Valhalla, High Prairie, and Slave Lake, much coal in use was from the Smoky River deposits near Grande Prairie. Although reserves of coking coal have been conservatively estimated at between 225 and 450 million tonnes and the reserves of bituminous coal at around 300 million tonnes (Dept. of Mines and Minerals 1968), there has not been much movement of coal from this region since the 1950's. This has been due to several reasons.

With dieselization of the railways' locomotive power in the 1960's and the increasing use of natural gas and electricity for heating and domestic uses, the intra-regional movement of coal along the N.A.R. routes diminished. In addition, the increasing popularity of road transport which uses diesel and petroleum fuels, the increasing tendency of people to travel by airplane, bus, and the private automobile, and the development of Northern Alberta's oil and gas fields around that decade, accentuated the decline of coal movements.

Up until the mid 1950's, there were only three main oil fields and 10 gas fields in Northern Alberta, which represented about 2% of Alberta's oil and gas production. By 1966, however, this had increased to 30% of the province's output (Table 4.11). In 1957, the Swan Hills, Kaybob and Sturgeon Lake fields had been discovered and had stimulated further exploration. By 1965, 30 oil fields and 45 gas fields had been developed and the number of producing wells had increased from 433 in 1961 to 853 in 1966. All this exploration and development meant that large quantities of drilling equipment and machinery, and pipes and other related materials essential to the extractive process were moved into the region by railway. This is reflected in the inward movement of goods under the category "Manufactures and Miscellaneous" which will be dealt with later in this chapter. It should be pointed out that the railway has carried the initial production of oil and gas in its special tank cars up until such time that pipe lines were constructed to link up with existing lines which carry the crude petroleum and natural gas to refining centres. In some instances, where no pipeline has been laid as yet, the railway still carries the crude out (for example, at Girouxville). Nevertheless, since 1960, separation plants at the site of a number of oil and gas fields (for example, at Judy Creek) have produced a few products such as condensates, penthates plus, and propane and butane, which are moved exclusively by rail.

TABLE 4.11

CRUDE OIL, NATURAL GAS AND BY-PRODUCTS PRODUCTION IN NORTHERN ALBERTA

	1956	1957	1959	1961	1963	1965	1966
Crude Oil	2476	3348	7218	18230	25253	45636	59453
Natural Gas	4128	12833	32296	36163	63328	69925	78018
Condensate	-	-	-	1	36	77	12
Penthates	-	-	-	3	213	222	349
Propane	-	-	-	-	48	72	95
Butane	-	-	-	-	5	86	94

NOTE ON UNITS: Natural Gas in millions of cubic feet.
All other in thousands of barrels.

SOURCE: Oil and Gas Conservation Board; Summary of Monthly Statistics, Alberta Oil and Gas Industry (accumulated by Alberta Bureau of Statistics)

From Table 4.11, it will be observed that oil production increased by nearly 3000% from 1956 to 1966, and gas production by nearly 2000% in the same period. It should be emphasized that this production does not include the discoveries and production at Rainbow and Zama Lakes, nor have we taken into account the vast potential of the Oil Sands deposits at Fort McMurray, Peace River, Buffalo Head, and Loon Lake. The reserves in the Fort McMurray region have been estimated at over 625 billlion barrels while that in the other three areas total a little over 50 billion barrels. In 1968, the G.C.O.S. plant at Fort McMurray commenced operations and Syncrude Canada began operations in 1978. Again, the N.A.R.'s involvement in moving in vast quantities of equipment and more importantly, in carrying out the byproducts of this extraction process, particularly sulphur, is reflected in the appropriate commodity categories.

Unlike the grain and lumber shipments from the Peace River area, which stimulated the construction of the N.A.R. mainline, mineral products did not occupy as prominent a position historically as they do now in the revenue traffic of this railway. From the inception of this railway and until the construction of the Great Slave Lake Railway, and the development of the Pine Point Mines, the chief mineral products carried on the N.A.R. lines were coal, crude petroleum, asphalt, gravel and sand, barytes, bentonite and clay, and salt. While these commodities

are still being carried on the N.A.R. with tonnages varying from year to year, they only account for approximately 10% to 15% of the total volume of mineral products moved on the N.A.R. lines today (Table 4.12).

With the completion of the Great Slave Lake Railway line in the summer of 1964, from the lead and zinc mines at Pine Point to Roma Junction on the N.A.R. line near Peace River, the net volume of mineral products moved on the N.A.R. increased considerably, from 152,085.6 tonnes in 1964 to 516,164.6 tonnes in 1965, with further increases thereafter (Table 4.13, Plate 4.6).

Of the 612,960.3 tonnes of mineral products moved by the N.A.R. in 1969, 540,236.7 tonnes of lead and zinc ores and their concentrates were delivered to the N.A.R. by the G.S.L.R., which is about 88% of the total volume. The balance 72,723.6 tonnes were composed mainly of sulphur (16,767 tonnes) from the Fort McMurray Oil Sands region, crude petroleum (11,361 tonnes) from the Girouxville and Mitsue fields, and coal (10,925 tonnes) from the Smokey River region. Barytes, clay and bentonite, gravel and sand, fluxing stone, salt, and asphalt made up most of the remaining tonnage (Figure 4.9).

Manufactures

Manufacturing is still in its infancy in Northern Alberta and has been experiencing "teething" problems. As Norrie comments: "Geographically peripheral areas of the country are just not

TABLE 4.12

N.A.R. MINERAL TRAFFIC: 1969

	Revenue Traffic Originating on N.A.R. in Tonnes	Received from Other Railraods G.S.L.R. in Tonnes	Total
Lead Ore and Concentrates		133,166.3	
Zinc Ores and Concentrates		406,062.9	
Anthracite Coal	108.0		
Bituminous Coal	10,925.1		
Other Concentrates		1,057.5	
Petroleum Crude	11,360.7		
Sulphur	16,767.0		
Barytes	8,467.2		
Salt	3,487.5		
Clay & Bentonite	15,462.0		
Gravel, Sand, Stone	5,699.7		
Asphalt	446.4		
TOTAL	72,723.6	54,236.7	612,960.3

SOURCE: N.A.R. Records, Schedule 35, Sheets 5 & 6

TABLE 4.13

PRODUCTS OF MINES IN TONNES: 1960 - 1969

1960	88,839.0	1965	516,164.4
1961	98,224.2	1966	736,428.6
1961	181,735.2	1967	789,108.3
1963	144,839.7	1968	737,840.7
1964	152,085.6	1969	612,960.3

SOURCE: N.A.R. Records, Schedule 35, Sheet 5 (1960-1969)

PLATE 4.6: Special Ore Cars on N.A.R. Carrying Lead and Zinc Ores from Pine Point

PLATE 4.7: Standard Tank Cars Carrying Crude Petroleum

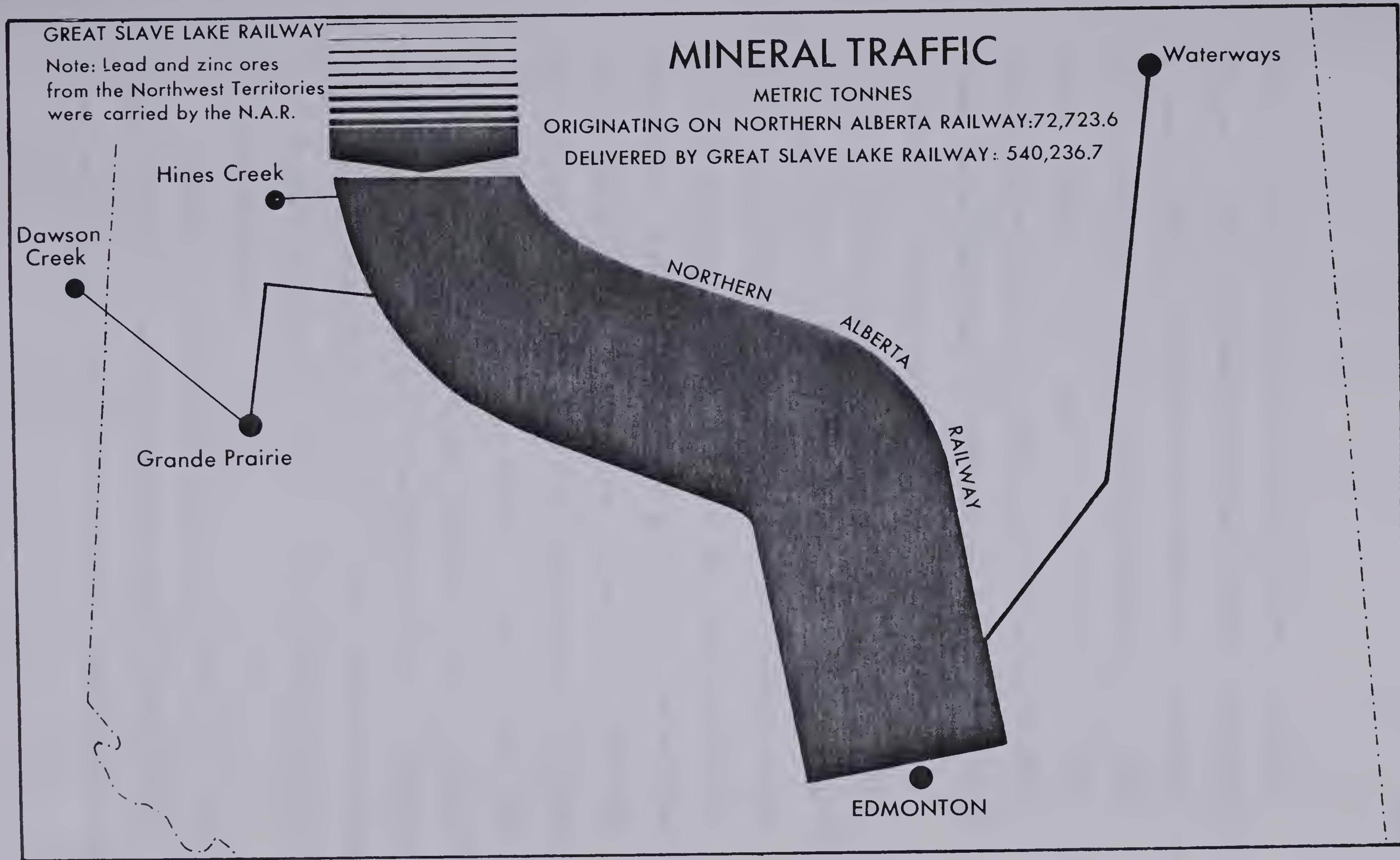
MINERAL TRAFFIC
METRIC TONNES
ORIGINATING ON NORTHERN ALBERTA RAILWAY:72,723.6
DELIVERED BY GREAT SLAVE LAKE RAILWAY: 540,236.7
GREAT SLAVE LAKE RAILWAY
Note: Lead and zinc ores
from the Northwest Territories
were carried by the N.A.R.
Hines Creek
Dawson Creek
Grande Prairie
NORTHERN
ALBERTA
RAILWAY
Waterways
EDMONTON

FIGURE 4.9

feasible sites to naturally attract most types of secondary industry. Their advantage lies rather with the further processing of locally available resources where there is a large weight loss, and with the production of some consumer goods for the local market." (Norrie 1976). There are about 200 manufacturing establishments within the hinterland of the N.A.R. and most of these can be classified as light industries and central place industries. Of these, nearly 150 belong to the wood group - (veneer, plywood, sawmills, planing mills, etc.) while the bulk of the remainder are in the "food and beverage group" - (bakeries, softdrinks, dairy products, etc.) with a few concrete plants, printing and machine shops located in the largest centres of population. The local markets are small due to the relatively sparse population and it has become increasingly evident that Northern Albertans are dependent on outside sources for almost all of the manufactured goods they require. This is clearly reflected in the waybills for incoming and inbound rail terminations on the N.A.R. lines. In addition to the rail shipments, it should be realized that a considerable amount of these products are brought into Northern Alberta by truck (for which no comprehensive statistics are available).

According to the Railways' schedule of monthly and annual statements, Group 5 entitled "Manufactures and Miscellaneous" lists over 150 items which covers almost all manufactured goods.

The total volume of goods moved into Northern Alberta by the N.A.R. in 1969, was approximately 399,577 tonnes of which petroleum products accounted for 264,470.4 tonnes, fertilizer 36,685 tonnes, iron and steel pipe and fittings 18,533 tonnes, cement (Plate 4.7) 18,432 tonnes, and agricultural implements, parts, and machinery 12,560 tonnes. Thus, nearly 85% of the total manufactured goods moved on the N.A.R. are comprised of these five items, of which petroleum and petroleum products accounted for 66% of the total and fertilizer accounted for nearly 10% of the total. Given the importance of these flows, some further description and explanation of these two commodities are appropriate.

Petroleum and Petroleum Products

The increasing use of road vehicles in Northern Alberta since the end of World War II, the use of sophisticated modern equipment in the farming, lumbering, mining and other related occupations have all created a growing demand for petroleum fuels and products. Further, the economic development of the Far North, in particular, the exploration for oil and natural gas, has placed heavy demands for steel, pipe, chemicals, and of course, fuel (Plates 4.8 & 4.9). Much of this fuel is also required to operate the barges of the Northern Transportation Co., Ltd., which offers heated transport services from Hay River, the G.S.L.R. terminal, down the MacKenzie River to the Arctic Coast.

PLATE 4.8: Bulk Cement Carried in Cement Hopper Car

PLATE 4.9: Jumbo Tank Cars Loading Propane at Mitsue

While most of the petroleum products are shipped from Edmonton refineries, there has been, in recent years, an increasing volume of petroleum products from the Pacific Petroleum refinery at Dawson Creek, due to the lower transporation costs. Petroleum and petroleum products move on the N.A.R. at standard Western Canada mileage rates which are published as "from point to point", with calculations on a mileage basis. For instance, the rate from Edmonton to Peace River is 45 cents per 45.36 kg (100 lbs) for a minimum loading of 10,886 kg (24.000 lbs) or more. On a straight mileage basis, the rate is much higher. For instance, taking the same point, Peace River, which is 500 km (310.8 miles) from Edmonton, the rate would be 81 cents per 45.36 kg (100 lbs) for the same minimum loading of 10,886 kg (24,000 lbs). It would appear that the special agreed charges on a "point to point" basis have been introduced as an incentive to capture those petroleum products that are "packaged" in order to compete with truck services. (Ibid, Chapter 3, pages 100-101).

Of the total 264,470.4 tonnes of petroleum products moving on the N.A.R. lines in 1969, 88,812.0 tonnes were terminated at points on this railroad (Table 4.13), while the bulk of the remainder 175,658.4 tonnes was delivered to the G.S.L.R. for termination at Hay River, since much of this petroleum and oil is essential to power the barges operating down the MacKenzie River (Figure 4.10). In addition, fuel is carried for the planes which serve the

TABLE 4.14

PETROLEUM AND PETROLEUM PRODUCTS.TRAFFIC TERMINATIONS BY SUBDIVISIONS
IN TONNES PER MONTH IN 1969

Subdivisions	1	2	3	4	5	6	7	8	Total Per Month
JAN.	560.7	1,128.6	-	269.1	360.9	3,109.5	293.4	1,292.4	7,014.6
FEB.	517.5	1,455.3	-	243.0	242.1	2,474.1	236.7	1,930.5	7,099.2
MAR.	209.7	975.6	-	198.9	303.3	3,375.0	133.2	2,009.0	7,204.7
APR.	220.5	660.6	-	243.9	117.9	864.9	257.4	2,267.0	4,632.2
MAY	359.1	4,639.5	-	421.2	175.5	1,179.0	288.9	2,070.9	9,134.1
JUN.	154.8	5,646.6	-	252.0	57.6	1,373.4	328.5	2,263.4	10,076.3
JUL.	324.9	5,121.0	-	463.5	117.9	1,399.5	182.7	3,004.2	10,613.7
AUG.	149.4	6,354.0	-	426.6	118.8	1,242.9	274.5	2,240.1	10,806.3
SEP.	223.2	3,293.1	-	358.2	175.5	738.0	146.7	267.3	10,806.3
OCT.	104.4	2,561.4	-	466.2	320.4	1,308.6	152.1	2,105.1	7,018.2
NOV.	180.0	725.4	-	513.0	320.4	1,495.8	158.4	1,946.7	5,321.7
DEC.	48.6	497.7	-	499.5	362.7	1,787.4	121.5	1,371.6	4,689.0
TOTAL	3,052.8	33,058.8	-	4,355.1	2,655.0	20,348.1	2,574.0	22,768.2	88,812.0

SOURCE: N.A.R. Records, Schedule 35, Sheets 7 and 8

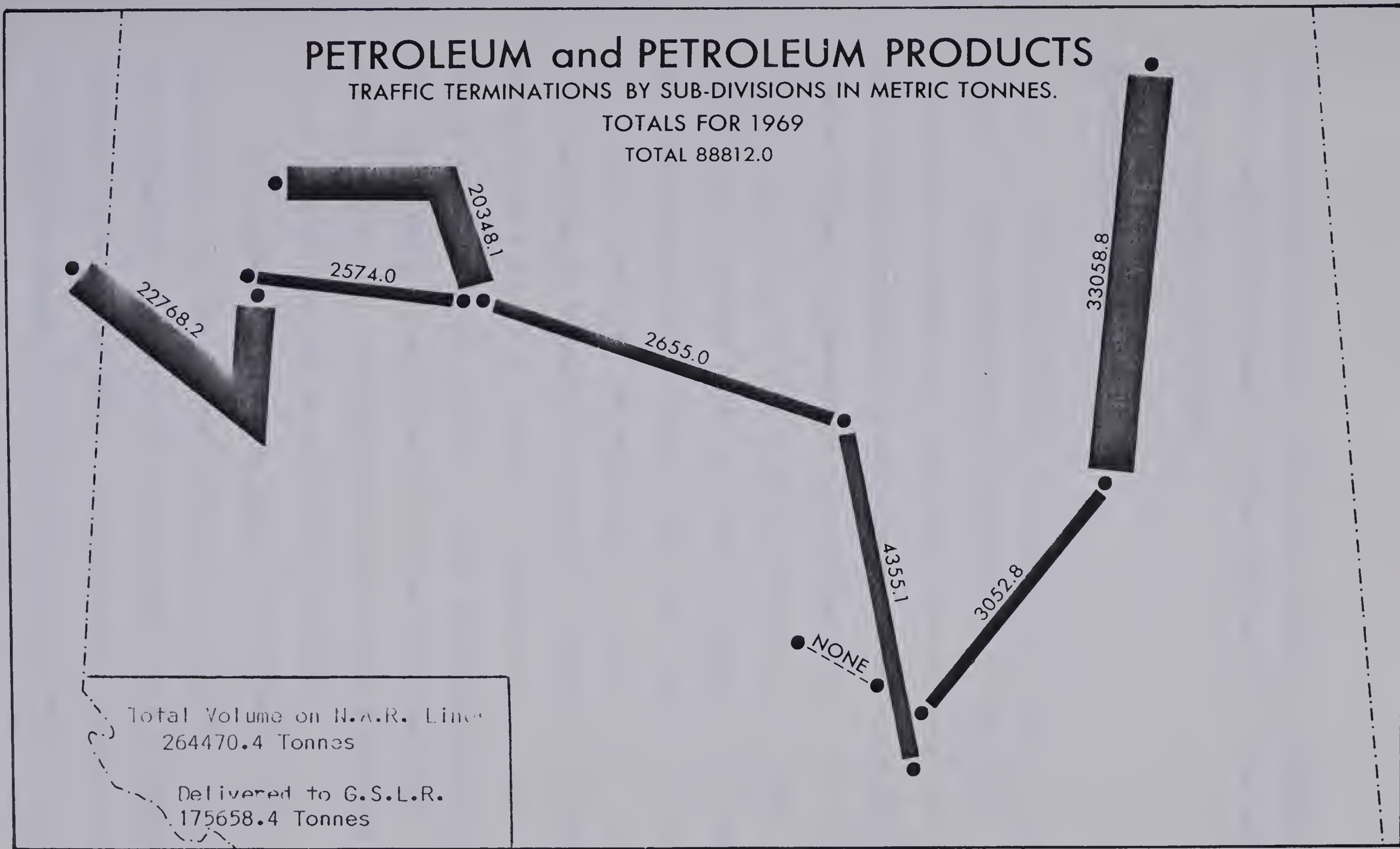
PETROLEUM and PETROLEUM PRODUCTS
TRAFFIC TERMINATIONS BY SUB-DIVISIONS IN METRIC TONNES.
TOTALS FOR 1969
TOTAL 88812.0
20348.1
2574.0
22768.2
2655.0
33058.8
4355.1
3052.8
NONE
Total Volume on N.A.R. Line
264470.4 Tonnes
Delivered to G.S.L.R.
175658.4 Tonnes

FIGURE 4.10

isolated communities of the Arctic lands, where air transportation is the main link and means of travel into and out of the region during the long winter months.

Manufactures: Fertilizer

Of the total 36,685 tonnes of fertilizer which moved on the N.A.R. in 1969, 30,067 tonnes were terminated on the N.A.R. lines, while the remaining 6,618 tonnes were delivered to the Great Slave Lake Railway, whose hinterlands have in recent years yielded increasing tonnages of grain (Brown 1971). The rates charged for hauling fertilizer were structured on a mileage basis, with "incentive rates" for heavier loadings. For example, the rate from Edmonton to Dawson Creek was 69 cents per 45.36 kg (100 lb) for a minimum loading of 18,144 kg (40,000 lb). This rate decreased to 63 cents for a 27,216 kg (60,000 lb) minimum, 47 cents for a 45,360 kg (100,000 lb) minimum, and 43 cents for a 52,432 kg (120,000 lb) minimum. It must be emphasized, however, that since 1969, increasing amounts of fertilizer and other chemicals essential to farming are being moved into the area by trucks because they provide door-to-door service.

The situation of declining margins and increased scale of operations in agriculture mentioned earlier (Chapter Two) has not only forced out the small inefficient farmer, but has necessitated expertise in farm management. This entails not only the ability to distinguish between suitable and unsuitable innovations, or

the scientific regulation of inputs into the farm business in order to provide maximum net returns, but also the ability to recognize innovations which would alleviate the pressures of the cost-price squeeze. Indicative of these trends, has been the ready adoption and use of chemical fertilizer, nitrogen and phosphates in particular, by farmers in the Peace region, who have access to pertinent information and advice from the Beaverlodge and Fairview Agricultural Research Centres.

The spectacular and increasing large amount of fertilizer being utilized by the farm operations in Northern Alberta are clearly reflected in the esclating tonnages of fertilizer terminating at points on the N.A.R. line between 1960 and 1968 (Table 4.15).

TABLE 4.15

VOLUME OF FERTILIZER TERMINATED ON N.A.R. LINES
1960 - 1968

1960	(9,487)	8,539 tonnes	1966	(48,571)	43,714 tonnes
1962	(24,417)	21,975 tonnes	1967	(58,899)	53,009 tonnes
1964	(32,534)	29,317 tonnes	1968	(48,305)	43,475 tonnes

In 1969*, over 20,000 tonnes of this commodity moved into the farming hinterlands served by the N.A.R. and was in fact related

*In some years, fertilizer is purchased in large amounts when prices have fallen. Consequently, larger than usual amounts are purchased and stored and in the following year, therefore, a slightly lower than average quantity is required. Hence, a lower than average tonnage is carried by rail. The average is between 30,000 and 40,000 tonnes. Of course, trucks are competing for this traffic, and in the seventies, the quantity of fertilizer carried by trucks has been increasing.

to some of the intensively farmed areas of the Peace River region - the Grande Prairie-Dawson Creek-Spirit River-McLennan block - which correspnds with the N.A.R. Subdivisions 7 and 8 with terminations increasing during the months of February and March and peaking in the months of April and May (Table 4.16). The other region which received fairly heavy inputs of fertilizer was the Edmonton-Barrhead-Lac La Biche farming sector which is served by the N.A.R.'s Subdivisions 1 and 3. By contrast, the lack of farming activities in the hinterland of Subdivision 2 (the Lac La Biche-Fort McMurray line) and to some extent, in Subdivision 5 (the Smith-McLennan line), is reflected in the absence and rather low tonnage terminations of fertilizer in these sections, respectively. The only area in the hinterland of Subdivision 5 where farming activity has been fairly well developed is in the environs of High Prairie and McLennan, and it was to these regions that the bulk of the 668.7 tonnes of fertilizer was delivered (Figure 4.11).

Summary

The flow patterns of the selected commodities moving on the N.A.R. have brought into focus some meaningful observations on freight movements, particularly when these flows are related to the demographic and economic characteristics of this region.

First, it has become quite clear that a fairly sparsely populated region whose people depend heavily on marketing the

TABLE 4.16

FERTILIZER: TRAFFIC TERMINATIONS BY SUBDIVISIONS
IN TONNES PER MONTH FOR 1969

Subdivisions	1	2	3	4	5	6	7	8	Total Per Month
JAN.	445.5	-	272.7	255.6	122.4	243.9	305.1	1,098.0	2,743.2
FEB.	271.8	-	370.8	264.6	273.6	510.3	417.6	1,291.5	3,400.2
MAR.	359.1	-	365.4	281.7	163.8	155.7	572.4	2,727.0	4,625.1
APR.	460.8	-	435.6	719.1	108.9	109.8	761.4	2,559.6	5,155.2
MAY	422.1	-	489.6	572.4	-	824.4	270.0	3,354.3	5,932.8
JUN.	-	-	-	45.9	-	-	133.2	515.7	694.8
JUL.	-	-	-	54.9	-	-	91.8	209.7	356.4
AUG.	109.8	-	108.9	54.0	-	-	100.8	462.6	836.1
SEP.	154.8	-	104.4	371.7	-	-	90.9	442.8	1,164.6
OCT.	159.3	-	99.9	271.8	-	54.9	150.3	888.3	1,624.5
NOV.	151.2	-	127.8	162.9	-	63.9	154.8	400.5	1,061.1
DEC.	145.8	-	163.8	109.8	-	99.0	325.8	796.5	1,640.7
TOTAL	2,608.2	-	2,538.9	3,164.4	668.7	2,061.9	3,374.1	14,746.5	29,234.7

SOURCE: N.A.R. Records, Schedule 35, Sheets 7 and 8

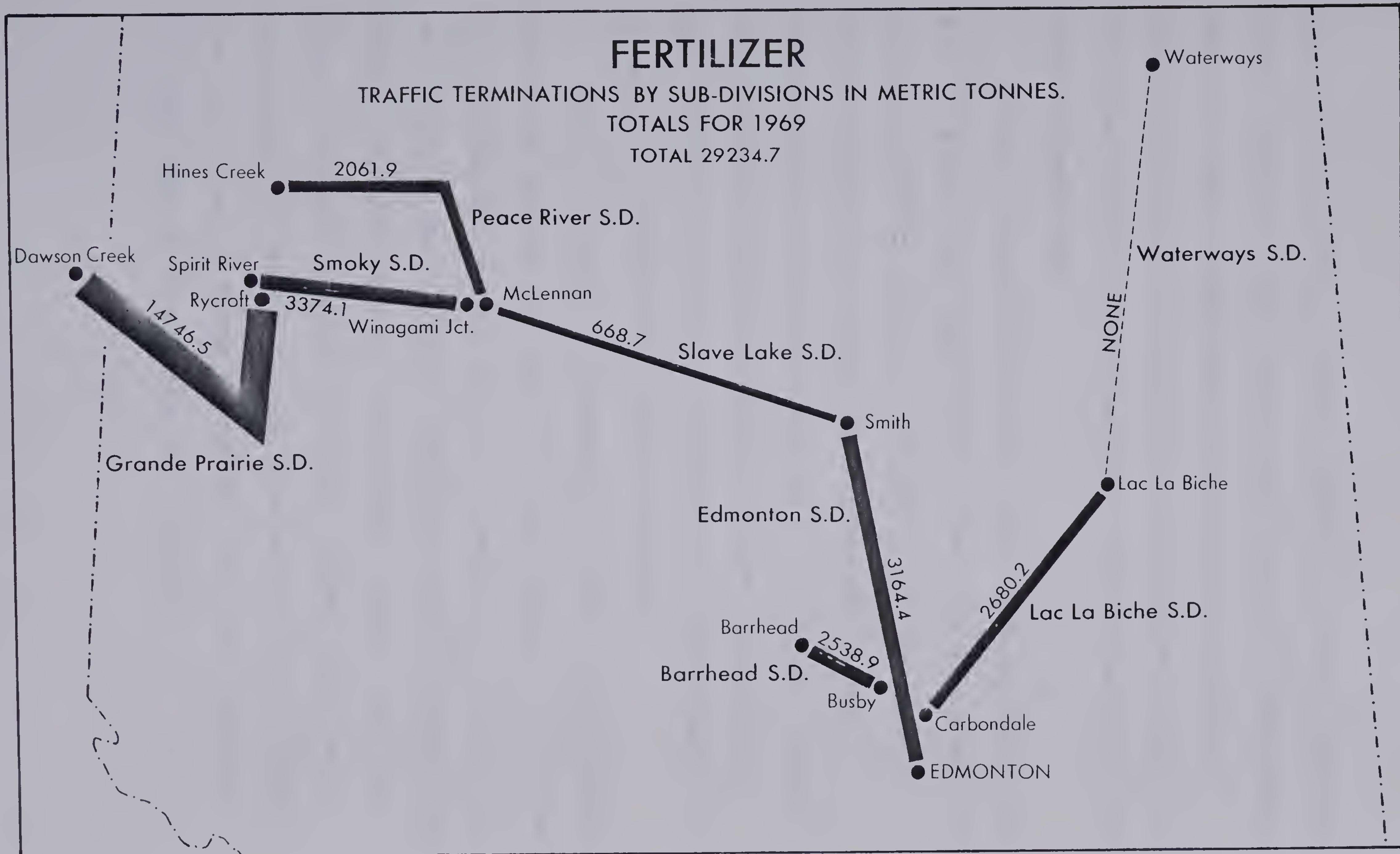
FERTILIZER
TRAFFIC TERMINATIONS BY SUB-DIVISIONS IN METRIC TONNES.
TOTALS FOR 1969
TOTAL 29234.7
Waterways
Waterways S.D.
NONE
Hines Creek
2061.9
Peace River S.D.
Dawson Creek
Spirit River
Smoky S.D.
Rycroft
3374.1
McLennan
Winagami Jct.
14746.5
668.7
Slave Lake S.D.
Smith
Grande Prairie S.D.
Lac La Biche
Edmonton S.D.
3164.4
2680.2
Lac La Biche S.D.
Barrhead
2538.9
Barrhead S.D.
Busby
Carbondale
EDMONTON

FIGURE 4.11

products of agriculture, forests, and mines, must also depend on outside sources for food, clothing, and a variety of manufactured goods, and some of these manufactured items are essential to their occupations such as machinery for agriculture, lumbering, and mining. This is clearly revealed in the flow patterns of the selected commodities.

Second, it becomes obvious that there has to be a very substantial production of agricultural, forest, and mine products to compensate for the comparatively higher priced manufactured commodities which must be imported into Northern Alberta. Transportation costs play a vital role in this matter inasmuch as the railway does charge more for the shipment of manufactured goods than for raw products. This factor has contributed to the railway losing much of this traffic to trucks.

Third, it seems that the movement of grain, forest products, and mineral products are captive to the railway and this is true to a considerable extent. Grain will remain captive to the railway as long as the regulatory rates are in force (Crowsnest Pass Rates), but these apply only to grain for export. Grain for domestic pruposes is moved at a higher rate and trucks could compete for this traffic. Hence, in a way, it is an advantage that the railway is forced to transport grain at a regulatory rate thus ensuring this traffic for the N.A.R..

While most of the bulky lumber products are captive to the railway, large trucks have encroached into this field for the movement of the partially finished lumber used in Alberta.

Another observation can be made with reference to the mining operations related to crude petroleum and natural gas production. In reviewing the movements of inbound or received traffic, one notices the surge in tonnage of rail traffic when the necessary equipment (e.g., pipes, fittings, and other materials) essential to the movement of crude oil to refineries in Edmonton, Calgary, or other distant points, are being transported by the railway. However, the movement of crude oil by rail is minimal. On the contrary, the movement of refined petroleum and petroleum products by rail has been on the increase and is the leading manufactured commodity moved into Northern Alberta.

CHAPTER FIVE

THE SEVENTIES

The advent of this decade augured well for the N.A.R., for in addition to the fairly well-established pattern of outward flows of grain, forest products, and mineral ores, and the inward movement of petroleum products, fertilizer, and mining exploration equipment, the rapid development of the Syncrude Project at the "Oil Sands" near Mildred Lake, just north of Fort McMurray, augmented the volume of traffic moving on the N.A.R. lines (Table 5.1, Figure 5.1).

While gross tonne kilometres of revenue freight increased from 1,335,000,000 in 1969 to 1,583,000,000 in 1974, with the upward trend continuing on to nearly 1,900,000,000 gross tonne kilometres in 1977, there were some years when either one or two of the staple exports showed a decrease in volume moved. Although the total net tonnages shows an increase, these figures do not reveal the annual fluctuations of commodity movements (Table 5.2).

While the pattern of commodity flows observed in 1969 has generally remained unchanged in the seventies, there has been developing a rather disconcerting trend (for the railway) in the

TABLE 5.1

VOLUME OF REVENUE TRAFFIC ON N.A.R. LINES: 1970 - 1977

Year	Cars	Tonnes
1970	28291	2438042.4
1971	25363	2385741.0
1972	25027	2257782.3
1973	22801	2104540.2
1974	20601	2060403.3
1975	25210	2425541.4
1976	28352	2587748.6
1977	29069	2625660.9

SOURCE: i) D.B.S. Annual Reports
ii) N.A.R. Annual Reports

VOLUME OF REVENUE TRAFFIC ON THE N.A.R. IN TONNES 1957-1977

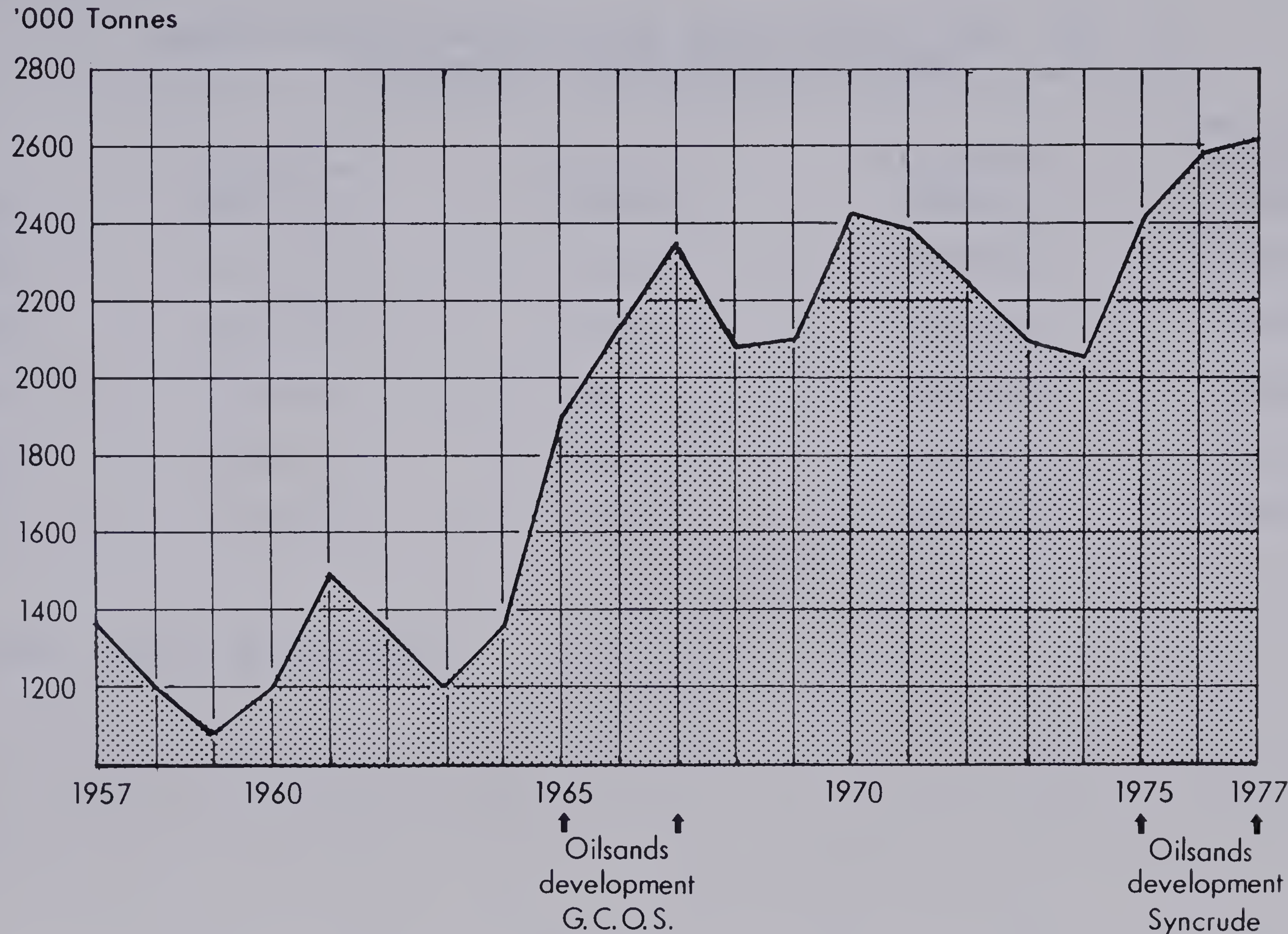

FIGURE 5.1

TABLE 5.2

VOLUME OF REVENUE TRAFFIC MOVING ON THE N.A.R. LINES: 1970 - 1977
BY COMMODITY CLASSIFICATION IN TONNES

Year	Products of Agriculture	Products of Forests	Products of Mines	Manufactures & Miscellaneous Products
1970	957,986.1	332,928.6	672,218.2	464,909.5
1972	820,293.3	368,835.3	547,019.7	521,634.0
1974	715,473.0	256,597.2	527,451.9	560,481.4
1976	1,161,611.1	395,597.0	486,289.5	562,251.0
1977	1,350,824.4	230,804.1	456,837.4	564,314.0

SOURCE: N.A.R. Annual Records

southbound or outward flows of particular segments of the forest products classification, specifically, the movement of certain fabricated or semi-finished products like plywood veneer and building boards. In 1973, for example, 560 carloads of plywood were moved on the N.A.R.. By 1976, there were only 301 cars utilized to move this commodity. While this reduction in the movement may be partly due to the vacillating demands of the home-building and related industries, this decline is to a large extent, attributed to competition from trucks. In 1974, for example, the General Manager of the N.A.R. referred to such competition when he lamented the loss of the plywood veneer business from the plant at Slave Lake:

"For years we had the peeler log business from Slave Lake to Edmonton", he said, "and we lost this business because the trucks undercut our rates; and now, when the plant was established at Slave Lake to peel the logs", he went on to say, "the trucks had already established their business and I have watched truck-load after truck-load of banded sheets of plywood veneer go by our headquarters building every day. Our trains should have been delivering those sheets to Edmonton for final preparation." (Perry 1974)*.

Fortunately for the N.A.R., the increased movement of equipment for the development of the Syncrude plant near Fort McMurray has has off-set this decline in lumber traffic. However, this inward movement of heavy equipment was only temporary. By early 1978

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*Mr. K. Perry - personal interview.

all of the essential materials had been delivered and the 1979 statistics would probably reveal a return to "normal" conditions. Nevertheless, the increasing inward movement of petroleum products as well as the fairly steady inflow of pipe and equipment related to the oil and gas exploration in the north would tend to maintain the levels of freight traffic movement experienced between 1976 and 1978 (Plates 5.1 & 5.2). Moreover, the Provincial Government's programme of promoting the development of secondary processing plants in rural areas has resulted in the establishment of some industries in Northern Alberta like the Northern Alberta Rapeseed Plant at Sexsmith in 1976, the Alfalfa Dehydrating Plants at Wanham and Grimshaw, and the Alberta Hardwoods and Aspenboard plants in the Industrial Park at Mitsue near Slave Lake. While the plants at Wanham, Grimshaw and at Mitsue have been closed temporarily due to financial difficulties encountered after a year or so of operation, the rapeseed plant at Sexsmith generated 518 rail cars (35,550 tonnes) of oil in 1977, and 631 rail cars (44,026 tonnes) in 1978. This plant is designed to process 500 tonnes of rapeseed per day, and generate over 2,000 rail cars of oil annually, and it is expected to deliver this volume in the early 1980's.

Traffic in mineral ores and grain is always southbound and is captive to the railway. The movement of mineral ores continues to be fairly steady, averaging between 400,000 tonnes and 500,000 tones annually, the bulk of this being lead and zinc ores delivered to the N.A.R. by the G.S.L.R. from the mines at Pine Point.

PLATE 5.1: Loaded Petroleum Tank Cars and Empty Ore Cars Moving North on N.A.R. Line

PLATE 5.2: Pipe Carried by N.A.R.

Though the movement of grain is captive to the railway because of the statutory freight rates, the vagaries of Northern Alberta's climate have sometimes presented the N.A.R. with a relatively low volume of grain for export, as was the case in 1973 and 1974 (Figure 5.1). However, the excellent harvests in the Peace River region in 1976 and 1977, generated an average of over a million tonnes of grain for export in each of those years. This volume is all the more remarkable when one considers that approximately 300,000 to 400,000 tonnes of grain are moved annually from the region via the Alberta Resources Railway out of Grande Prairie. In 1972, the northern part of this A.R.R. line had been closed to traffic due to serious flood damage, but traffic resumed in late 1974.

As mineral exploration in the Far North intensifies, and as the development of mineral, oil, and gas resources accelerates in Northern Alberta, together with the establishment of related industries in the region, it is anticipated that there will be a change in the kinds of commodities moved into and out of the region by the N.A.R.. It is perhaps appropriate to recall a statement made in 1975 by the General Manager of the N.A.R., Mr. Ken Perry, who said:

> "Twelve years ago, that is, during the 1960's, grain was the most important revenue freight commodity, but today, lead and zinc ores from Pine Point provides the largest earnings, followed by lumber and petroleum products, thus relegating grain to the fourth position.

> The Oil Sands is now providing the railway with a massive freight haul and will continue to provide an ample volume of freight in and out of Fort McMurray, and we estimate that by the time Syncrude is completed, 300,000 tonnes to 400,000 tonnes of construction material would have been moved into the region.
>
> Further, each additional plant will require between 400,000 and 500,000 tonnes. The requirement to haul sulphur and perhaps coke from the Oil Sands region will also provide a substantial volume of southbound freight, as evidenced by the current contract with G.C.O.S. to haul over 250,000 tonnes of sulpur out of the plant. It is envisaged that the construction of the MacKenzie Valley gas pipeline will induce an estimated 4,000,000 tonnes of construction material via the Peace River region - a massive inbound freight haul for the N.A.R. on its northwest line."*

In order to cope with the accelerated volume of materials and supplies essential to the completion of the Syncrude Plant, the northeast line to Fort McMurray has been rapidly upgraded with heavier rail (50 kg and 55 kg to the metre) (Plate 5.3) and ballast, treated ties, stronger bridges, and a host of other technical renovations to enable some very heavy equipment, for example, the Gofiner Reactors for the Oil Sands plants, to be carried on this line (Plates 5.4 to 5.7). In 1975, the N.A.R.'s intermodal service terminal and yards at Lynton, about 16 km south of Fort McMurray, were completed (Plate 5.8). With its piggy back ramps and tracks, special sulphur loading tracks, and other modern technological equipment, it is designed to handle

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*Kenneth Perry - 1975, quoted in Edmonton Journal, June 17, 1975.

PLATE 5.3: Upgraded Track on N.A.R. Line to Fort McMurray

PLATE 5.4: Gofiner Reactor being Loaded on Rail Flat Car

PLATE 5.5: Reactor enroute to Fort McMurray via N.A.R.

PLATE 5.6: Reactor Near Fort McMurray

PLATE 5.7: Reactors on Site at Syncrude Plant

PLATE 5.8: Inter-modal Yard at Lynton Near Fort McMurray

between 200,000 and 300,000 tonnes of sulphur trucked annually to this yard from the G.C.O.S. plant and destined for Quebec City (Plates 5.9 and 5.10). Unfortunately, in late 1976, the movement of sulphur to Quebec was temporarily suspended due to the low level of world sulphur prices.

It is anticipated that by the time the Syncrude Plant is completed, approximately 500,000 tonnes of traffic would have been moved into the area via this intermodal yard. Recently, the terminal has been busy handling pipe and equipment for the Alberta Energy Company Pipeline as well as for the Canadian Utilities Gas Pipeline.

There have also been equipment purchases in response to the increased traffic on the northwest or main line of the railway. Four SD38-2 diesel locomotives were purchased specifically to handle the increasing loads of lead and zinc ores, lumber and grain on the Smokey and Peace River gradients (Plate 5.11). Rated at 2,000 horsepower, these sophisticated locomotives were designed to operate at steady continuous speeds on the steepest gradients. In addition, the N.A.R. has been allocated fifteen of the new Government "hopper" cars per day to handle the ever increasing shipments of grain moving on the lines (Plate 5.12). Each hopper car which is equipped with roof hatches and four discharge gates has a 128.8 cubic metres (4550 cubic feet) capacity and will contribute a great deal to the rapid movement of grain out of the Peace River region. In the words of Dr. Hugh Horner, until recently, Deputy

PLATE 5.9: Sulphur Ready for Loading at Lynton

PLATE 5.10: Sulphur in Gondola Cars enroute to Quebec

PLATE 5.11: One of 4 SD38-2 (400 Series) Diesel Locomotives

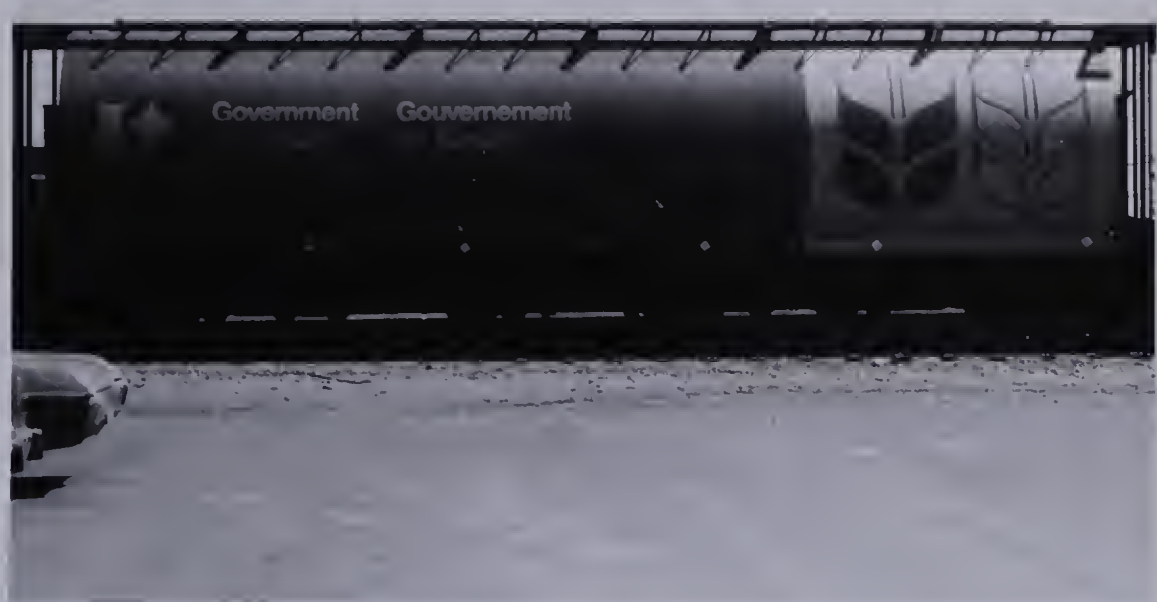

PLATE 5.12: 228.8 cu metre (4550 cu ft) Grain Hopper in use on N.A.R.

Premier and Minister of Transporation in the province of Alberta, "More grain can be carried by one train when hopper cars are used rather than conventional box cars. Further, turn around time is accelerated due to reduction in cleaning time, quicker loading and unloading." (Jan. 1976)*.

Branch Line Abandonment

In light of these extensive renovations to the rail network, including the upgrading of tracks on lightly used branch lines, the N.A.R. is not preparing to abandon any of its branch lines and indeed, the company has not applied for the closure of any of them. True there are sections of its lines which do not generate much traffic and the Hall Commission has listed these as conditions for closure. These sections are:

(i) the section between Barrhead and Busby,

(ii) the section between Spirit River and Rycroft, and

(iii) the section between Hines Creek and Roma Junction.

From numerous studies made by various Royal Commissions, it has been concluded that it was essential that a line generate at least 90,000 net tonne kilometres per kilometre of traffic to remain a viable operation. They found approximately 12,000 kilometres of light or poor density lines mostly in the Prairies in

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*Television Broadcast, C.B.C. Also quoted in Edmonton Journal.

the unprofitable group, with losses totalling $13 million. At the same time that the Commission recognized the railway's problem, it also realized the economic and social problems that would arise in the communities now served if these lines were abandoned. As a result, it recommended:

> "That under the administration of the Board of Transport Commissioners for Canada, an annual grant of $13 million be made available to provide compensation for losses actually incurred in the operation of lines which the railways are prepared to abandon, but which shall be continued for a period of time to be determined by the Board." (Royal Commission 1961)

In 1967, Parliament accepted the principles outlined in the provisions pertaining to rail line abandoment which are found in section 314 of the National Transportation Act 1967. In effect, it advocates that a railway company desiring to abandon the operation of a line is required to file an application with the Commission showing costs and revenues of the line for a number of years. Reviewal of the financial losses by the regulatory board will be made, and the "actual loss" determined (Sec. 314b(3)), and after public hearings have been conducted to determine any "inconvenience" experienced by the communities affected (Sec. 314C(3)). If, after these hearings, the Commission determines that the line is uneconomical, it may either order its abandoment in whole, or in part, or provide for its continued operation, with the actual loss of the operation being "charged" to the

Minister of Finance who pays the "subsidy" out of the Consolidated Revenue Fund. The loss is retroactive to the period commencing ninety days after the date of application for abandonment.

Although the N.A.R has not applied for abandonment of services on their lines, it has presented to the Commission for review, the costs and revenues of the three sections mentioned earlier in this chapter, in order to acquire the subsidies which it does receive (Table 5.3). Thus the N.A.R. continues to operate trains on these lines as the traffic warrants. There are no fixed scheduled train services and service is provided on an "as and when" basis, which is normally once a week. Nevertheless, during heavy grain shipping periods, or when lumber plants are fully operative, service is provided two or three times a week.

It is apparent that more sweeping economic and social issues are present in current and future rail line abandoment involving the overall grain economy of the Prairies and will, as Professor A. W. Wood* said, "require wider ranging evaluations...require that costs of performing the services needed...and will also require a detailed study of handling and storage facilities... until information is collected on a wide range of transporation and related services." (Young 1966).

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*Comment by Professor A. W. Wood in the foreword to a study by K. W. Young on the varying influences affecting trucking costs.

TABLE 5.3

CLAIMED LOSSES ON PRAIRIE BRANCH LINES BY NORTHERN ALBERTA RAILWAYS UNDER SECTIONS 256 and 258 OF THE RAILWAY ACT: 1967 - 1975

Year	Claimed Losses	Payments to Date
1967	$ 2,164,666	--
1968	2,569,102	$ 903,551
1969	3,065,247	897,114
1970	3,001,265	1,173,833
1971	2,986,891	1,120,191
1972	3,213,241	1,162,681
1973	3,452,334	1,782,196
1975	5,372,830	2,269,604
Total (1967 - 1975)	$31,112,993	$10,861,998

SOURCE: Grain and Rail in Western Canada, Hall Commission Report (1977); Vol. I, page 181

Research in this area has been conducted and a number of studies, notably those by the Geographical Branch of the Department of Energy, Mines and Resources, as well as the Economics branch of the Department of Agriculture, have provided some valuable information and data. The studies reveal that the loss of the grain elevator service would have no effect on many communities and a material loss to only a few (Hodge 1968). It was further revealed that only a few farmers hauled their grain to the "nearest" elevator. Most preferred to travel longer distances on a good road and to communities which afforded more services* (more than 30 services) than a grain elevator function (Om Tangri 1964, 1965).

Further studies pertaining to the problem of efficient grain handling, the distribution, quality, and size of elevators, and the avoidance of bottlenecks in grain movement for export have been underway for some time now, and if implemented these could have a profound effect on the railway systems as well as the total transportation complex.

From this brief survey, it may seem appropriate to abandon the services on the Spirit River-Rycroft extension and probably retain, for the time being at least, the other two sections. Of

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*Services are identified as including: grain elevators, 3 or 4 banks, stores, garages, farm equipment dealers, post office, liquor store, restaurants, recreation facilities, churches, hospitals and schools. (see A. W. Burgess and J. W. Channon, "Prairie Regional Studies in Economic Geography", No. 1, Canadian Department of Agriculture, Ottawa 1968).

the other two, Barrhead is a fair sized town with over sixty services and while it is near enough to Westlock (about 40 km) it probably warrants railway services. However, resource development, e.g., sawmills, in the near future, may warrant the retention of services on all these lines, with suitable realignments and additions.

Withdrawal of Passenger Services

Though this study has been mainly concerned with the movement of goods rather than with people, it is appropriate to take a brief look at the history of passenger traffic on the N.A.R. up to its termination in the 1970's. Up until World War II, when roads were limited and good roads were more the exception than the rule, the railway was the cheapest, most comfortable, and generally, the best means of access for travellers moving into and out of the region. In addition to being the chief courier of all the mail and express freight, the passenger train was the avenue for the exchange of ideas and the link with the outside world.

Moreover, special low fares and rates were made available to the prospective settler, his family, and his personal effects. This encouraged the rapid settlement of the Peace River region as well as the utilization of the services offered by the railway. Passenger traffic was so heavy that train services between Edmonton and the Peace District were increased from a "once-a-week" service in the 1920's to a "twice-a-week" service in the

TABLE 5.4

PASSENGER REVENUES ON N.A.R.: 1940 - 1960

1942	$ 846,252	1950	$493,319
1943	2,171,096	1951	493,609
1944	1,136,453	1953	455,565
1946	772,663	1955	353,984
1947	605,517	1957	309,978
1948	543,269	1958	282,923
1949	546,826	1959	227,184

SOURCE: N.A.R. Records

1930's. With the advent of World War II and the movement of troops, passenger services had to be increased to a "daily service", in addition to the "special troop trains" which were in operation. Passenger revenues in the 1930's averaged between \$220,000 and \$250,000 per annum and climbed rapidly in the 1940's to a peak of \$2,171,000 in 1943 (Table 5.4).

With the post-war development of highways and roads, the bus and motor car, passenger traffic by rail as had been noted earlier, declined rapidly. By 1955, passenger train services between McLennan, Peace River, and Hines Creek were withdrawn as were the services between Busby and Barrhead.

By 1970, passengers on the weekly train between Edmonton and Dawson Creek had dropped to a mere trickle, and it was obvious that the N.A.R. was operating its passenger services at a loss which was estimated at \$450,000 annually.

TABLE 5.5

PASSENGER REVENUES ON N.A.R.
1970 - 1974

1970	1971	1972	1973	1974
\$26,304	\$24,572	\$22,677	\$22,806	\$19,243

SOURCE: N.A.R. Records

It is also apparent from Tables 5.6 and 5.7, that the number of passengers travelling by rail did not warrant the operation of passenger trains on this main line. Bus services operate into

TABLE 5.6

NORTHERN ALBERTA RAILWAYS COMPANY
REVENUE PASSENGERS HANDLED, TRAIN NO. 1,
EDMONTON - DAWSON CREEK, FOR THE PERIOD
JANUARY 1970 TO DECEMBER 1970

Train No. I
Edmonton - Dawson Creek

1970 Month	No. of Trips	Thru	Average Per Trip	Local	Average Per Trip	Total	Average Per Trip
January	9	16	2	35	4	51	6
February	8	21	3	32	4	53	7
March	9	26	3	24	3	50	6
April	8	30	4	41	5	71	9
May	9	26	3	23	3	49	6
June	9	39	4	23	3	62	7
July	9	48	5	32	4	80	9
August	8	47	6	23	3	70	9
September	9	17	2	7	1	24	8
October	9	9	1	23	3	32	4
November	8	11	1	20	2	31	3
December	9	22	2	34	4	56	6

SOURCE: N.A.R. Records

TABLE 5.7

NORTHERN ALBERTA RAILWAYS COMPANY
REVENUE PASSENGERS HANDLED, TRAIN NO. 2,
DAWSON CREEK - EDMONTON, FOR THE PERIOD
JANUARY 1970 TO DECEMBER 1970

Train No. 2
Dawson Creek - Edmonton

1970 Month	No. of Trips	Thru	Average Per Trip	Local	Average Per Trip	Total	Average Per Trip
January	9	13	1	52	6	65	7
February	8	9	1	24	3	33	4
March	8	20	2	20	2	40	4
April	9	38	4	37	4	75	8
May	9	16	2	59	7	75	9
June	8	29	4	25	3	54	7
July	9	43	5	38	4	81	9
August	9	49	5	63	7	112	12
September	9	20	2	24	2	44	4
October	9	21	2	36	4	57	6
November	8	8	1	21	2	29	3
December	9	33	4	29	3	62	7

SOURCE: N.A.R. Records

and out of the Peace River region three times per day on both the main highway routes (Tables 5.8 and 5.9)and the fares are reasonably competitive (Table 5.10). Furthermore, the bus services are faster and the convenience afforded by the road vehicles are well worth the slightly higher fares. In addition, passengers travelling by the N.A.R. to and from Edmonton must disembark and embark at Dunvegan Yards station which is several miles from downtown Edmonton. On the contrary, the bus terminal is situated in the heart of Edmonton's business district, which is well serviced by taxis, the Edmonton Transit (Bus) services and in recent years, the L.R.T. (Light Rail Transit). However, it was the privately owned automobile which sounded the "death knell" of the passenger train services. This mode combined with the concurrent development and improvement of an excellent network of roads and highways together have provided people with the most versatile and independent mode of transportation (Ibid, p. 55, Figure 3.7).

Thus, on June 1, 1976, the last passenger train on the main line - the northwest arm of the N.A.R. - ground to a halt* (R.T.C. 1974). The only rail passenger service in operation at present is that on the northeast line from Edmonton to Fort McMurray. In effect, it is a "mixed" train, whereby two or three

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*R.T.C.: Railway Transport Committee. Order R-18508, April 11, 1974.

TABLE 5.8

ALTERNATIVE TRANSPORTATION SERVICES 1970

DIRECT BUS SERVICE EDMONTON, ALBERTA TO GRANDE PRAIRIE, ALBERTA AND LOCAL TO DAWSON CREEK, BRITISH COLUMBIA

COACHWAY SYSTEMS

	Daily	Daily	Daily
Edmonton	Lv. 9:00 P.M.	11:45 P.M.	9:00 A.M.
Grande Prairie	Ar. 3:35 A.M.	6:15 A.M.	3:15 P.M.
Grande Prairie	Lv. 3:50	6:45	3:30
Beaverlodge	Lv. 4:20	7:20	4:00
Mythe	Lv. 4:35	7:35	4:15
Demmitt	Lv. 4:45	F	F
Pouce Coupe	Lv. 5:28	8:25	5:05
Dawson Creek	Ar. 5:40	8:35	5:15
Dawson Creek	Lv. 9:30 P.M.	8:30 A.M.	11:30 A.M.
Pouce Coupe	Lv. 9:40	8:40	11:40
Demmitt	Lv. 10:10	F	12.15 P.M.
Hythe	Lv. 10:30	9:25	12.35
Beaverlodge	Lv. 10:45	9:40	12.50
Grande Prairie	Ar. 11:25	10:15	1:20
Grande Prairie	Lv. 11:40	10:35	1:35
Edmonton	Av. 6:15 A.M.	4:45	7:55

SOURCE: N.A.R. Documents

TABLE 5.9

ALTERNATIVE TRANSPORTATION SERVICES BY
NORTHERN ALBERTA RAILWAYS 1970

ROUTE NO. 1: Edmonton-Dawson Creek, B.C.
(via Highways 43, 2 and 34)

Daily except Friday and Saturday

Westbound				Eastbound
11:00 P.M.	Lv.	Edmonton	Ar.	
6:00 A.M.	Av.	Grande Prairie	Lv.	7:00 P.M.
6:15 A.M.	Lv.	Grande Prairie	Ar.	6:45 P.M.
8:15 A.M.	Ar.	Dawson Creek		4:45 P.M.

ROUTE NO. 2: Edmonton-Grande Prairie
(via Highways 43 and 34)

Westbound				Eastbound
12:00 P.M.	Lv.	Edmonton	Ar.	11:45 P.M.
7:00 A.M.	Ar.	Grande Prairie	Lv.	5:00 P.M.

ROUTE NO. 4: Edmonton-High Prairie

Westbound				Eastbound
10:00 P.M.	Lv.	Edmonton	Ar.	10:00 P.M.
		Smith	Ar.	6:00 P.M.
		Slave Lake	Ar.	4:30 P.M.
		Kinuso	Ar.	3:30 P.M.
		Faust	Ar.	3:00 P.M.
5:30 A.M.	Ar.	High Prairie	Lv.	1:30 P.M.

SOURCE: N.A.R. Documents

TABLE 5.10

COMPARISON OF SOME ONE-WAY RAIL AND BUS FARES

From	To	Rail	Bus
Edmonton	Westlock	$ 1.60	$ 2.45
Westlock	Smith	$ 2.40	$ 3.35
Smith	Slave Lake	$ 1.00	$ 1.90
Slave Lake	McLennan	$ 3.00	$ 4.20
McLennan	Rycroft	$ 2.70	$ 3.35
Edmonton	Grande Prairie	$12.10	$12.90
Rycroft	Grande Prairie	$ 1.50	$ 1.95
Grande Prairie	Dawson Creek	$ 2.70	$ 3.80
Edmonton	Dawson Creek	$14.70	$16.65

SOURCE: i) N.A.R. Documents
ii) Greyhound Bus Service Admin.

passenger coaches are attached to the regular freight train service.

In reviewing the changes and improvements that have been made to the railway and its physical plant in the last fifteen years, one should also focus on some of the more prominent features that have contributed to making the N.A.R. a more efficient transportation system. Some of the changes and improvements are:

Completion of dieselization, upgrading and ballasting of the entire system, construction of a new station, stores, freight shed and depot at Dunvegan Yards, a new Maintenance of Way Equipment Repair Shop and a new 24,000 sq ft (222.97 sq metres) Headquarters Office Building at Dunvegan Yards (Plate 5.13), the completion of the inter-modal yard at Lynton, the inauguration of trucking services and Central Agency Services, the lengthening of strategically located sidings, installation of heavy rail in the yards and on critical sections of the lines, the purchase of trucks and operation of express services at important terminals, the use of end to end train radio, train dispatcher radio, telex, teletype, and punch card systems are some of the renovations designed to improve the services of this railway. In addition, the company has leased one hundred new cars which were put to use in mid 1979 to haul lumber traffic (Plate 5.14).

Thus, since 1960, with extensive changes and technological improvements costing over $22,000,000, with property which

PLATE 5.13: New N.A.R. Headquarters Office at Dunvegan Yards

PLATE 5.14: One of 100 New Lumber Cars Leased by N.A.R.

includes 6,788 hectares (1,6773 acres) of land on which are situated 149 grain elevators and 80 fertilizer warehouses, and with an average annual movement of between two and three million tonnes of revenue freight, the N.A.R. has to be considered as one of the more prosperous and modern originating bridge-line railway systems in North America (Wallace 1963). It is equipped to handle present flows and well-equipped to take care of the increase in traffic which is likely to develop in the near future.

It is anticipated that as exploration in the far north accelerates, traffic composed of heavy machinery and equipment, pipe and other construction materials, will be moved into develop the MacKenzie Valley and Arctic Coast. The final decision to construct the Alaska Highway Pipeline would likely increase the volume of inward freight, probably consisting of pipe, cement, and a variety of equipment.

Railway development, therefore, has been a response to two types of economic incentives which were often complementary. One was the need to link potential markets, represented by the rail lines to Peace River and Grande Prairie, and their extensive hinterlands, which, it should be noted, also meant linking areas of potential agricultural production. The other was the need to join these areas of agricultural, mineral, and lumber production to an outlet on the world and national markets. The northeast

line to Fort McMurray enabled vast quantities of modern heavy equipment required for the development of the Tar Sands to reach them and thus, create the necessary impetus for the vast oil industry in that region.

CHAPTER SIX

RETROSPECT AND PROSPECT

The emergence of railroad transportation in Northern Alberta proved to be a powerful instrument of economic, cultural, and social change. With the help of these lines, the diverse regions of Northern Alberta including the old centres of sedentary agriculture, the desultory trading posts, and the early nuclear settlements were incorporated more fully into the economic life of Alberta and the nation. Some of the major changes associated with the advent of the railway in Northern Alberta were the following:

(a) the intensified commercialization of agriculture;

(b) the expansion of urbanization;

(c) the stimulus to rapid settlement;

(d) the trend towards regional centralization;

(e) the incentive to mineral resources development.

Only a railway could fructify the agricultural resources of this region, but in the early 1900's, private capital could not easily be tempted to undertake the hazardous venture. Later, when the tide of settlement was moving swiftly, private capital could not keep up with the rising demand for railway services. It was characteristic of this as of other pioneer regions that governments were willing to mortgage the future income from their resources by

assuming heavy fixed charges or heavy contingent liabilities in order that the much needed capital equipment might be obtained. This was particularly evident during the years when the trend of settlement was sharply upward and government subsidies and other inducements for the construction of railways were lavishly offered.

The railway proved to be an important stimulant to settlement and today, the economic foundation of the Peace region, and its resource extraction is, as it were, suspended from the rail net. The 1974 strike by the major railway companies' personnel, though short lived, demonstrated the economic dislocation that could result from a prolonged strike. As we have seen from the statistics, all of the grain from the Peace Region is moved by rail, the bulk of it by the Northern Alberta Railways and most of the remainder by the Alberta Resources Railway* (via the C.N.R.) to Vancouver. Very little is hauled by truck, and this is mainly seed grain within the region itself. The very low statutory rail rates on grain for export are the main factors accounting for this situation.

While the railways played a vital role in the initial settlement of the Peace region, as well as the gradual integration of early settlements, the construction of highways and roads have proved to be the most potent force in the final breakdown of

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*In 1970, for example, 322,740 tonnes of grain moved on the A.A.R. line to Vancouver.

isolation which had been the main inhibiting factor, not only in the integration of the farming settlements distant from the nearest railway point, but in being able to offer "a certain versatility and flexibility of services" from farm house to urban centers and markets, and vice versa. Improved transportation appears to be the reason for the increasingly eccentric position of the farmstead among its holdings, in this case, because of an even further tightening, not loosening, of transportation bonds. In "The Sociology of Rural Life", Smith (1953) has noted this trend in the United States where, as soon as a new highway or road is completed, farmers begin relocating their houses and barns in order to be on it or near it.

In reviewing the present condition of agriculture in the Peace River region and the changes that have occured since World War II, the general trend is that all of the dairy produce and livestock in the region is being hauled by trucks. This has resulted in the virtual absence of livestock movements by rail and the disappearance of the railway stockyards from the rural scene.

Peace River farmers are gradually tending away from their dependence upon the cereal grains as the main source of their income. Diversification of production and increasing specialization within enterprises are appearing both with respect to the introduction of other crops as well as to an increasing emphasis on livestock and livestock products. Admittedly, this tendency

is a gradual one. However, it may be expected that as the market for these other products increases, farmers will be able to move into that area of production very rapidly as a result of their current experiences. As Gregor noted:

> "Regional specialization has become an increasing impediment to the development of the Thunen pattern as transportation has grown and improved, lowering transport costs and thereby reducing the economic advantage of proximity to markets relative to other locational forces - principally climate, soil and terrain. This trend towards areal specialization based more on environment than on market distance is reinforced by technological and marketing changes that stress economies of scale." (Gregor 1970)

There is little doubt that the railway has been instrumental in the exploitation and development of the vast resources of Northern Alberta. The movement of heavy essential equipment for the development of the Tar Sands as well as the conveyance of vast quantities of gravel, cement and other exploration materials by the N.A.R. is evidence of this. As the frenzied search for fossil fuels intensifies in the far North, it is expected that this railway will play an increasingly important role by delivering a variety of exploration and exploitation materials via the McKenzie River route.

While pipelines are indisputably the cheapest method of moving crude oil and natural gas to the refineries and distribution centres, the initial capital costs entailed in their construction, the involvement of national and international interests, federal and provincial government policies, as well

as the agitation of environmentalists, all combine and even conspire to retard the early exploitation of the vast reserves of oil and natural gas in the far North.

Just as we associate the grain elevators and the monotonous expanse of grain fields, the zinc, lead, and coal mines, as well as the oil and gas fields, with the railroad, we may attribute the current changing scenes of livestock ranges and cattle sheds, dairy farms and milk sheds, poultry farms and pig pens, fruit and vegetable gardens, and apiaries with the road and truck.

In conclusion, it might be pertinent to suggest that there are many avenues for improvement in the total rail transportation system serving Northern Alberta. Some of these might well include the following, which do warrant some attention and consideration.

1. The construction of two rail extensions to the present N.A.R. system, namely: (a) a line from Hines Creek to Spirit River and (b) a line from Spirit River to Dawson Creek. With the development and expansion of port facilities at Prince Rupert, B.C., these extensions would link up with the Canadian National line to Prince Rupert. Thus grain shipments to the west coast ports of either Vancouver or Prince Rupert would be expedited. In addition, the line from Hines Creek to Spirit River would generate a sub-

stantial volume of lumber traffic which now moves exclusively by truck from Hines Creek to the Proctor and Gamble Lumber complex at Grande Prairie.

2. The present G.S.L.R. and A.R.R. lines should be amalgamated with the N.A.R. lines and the entire system could be operated by the Northern Alberta Railway Company. This manoeuver would eliminate the allocation of revenues to each of the separate railways for their services as well as the time consuming interchanges at Roma Junction and Grande Prairie, thereby accelerating the movement of grain, lumber, mineral ores, and petroleum products.

3. The statutory rates on grain (the Crow rate) must be reviewed and re-scaled to reflect the costs of inflation and the devalued Canadian dollar, thereby alleviating the losses incurred by the railway for the movement of grain. Furthermore, the domestic rates on grain should be abolished, as this is detrimental to the Alberta meat producer, who must feed his livestock on grain which costs more than for the Eastern meat producer who feeds his livestock on grain moved at the cheaper Crow rate.

4. It follows therefore, that if the Crow rate is re-evaluated to the current financial climate, the higher cash returns to the railway could be utilized for the construction of the modern concept of the "throughput" systems* for grain movement. This would rationalize the present elevator system which has retarded the movement of grain for export.

A recent study on grain handling in the United States (commissioned by Dr. Hugh Horner's Economic Development Department, Province of Alberta, 1978) has revealed that there is much room for improvement in the production, marketing, handling, and transportation of grain. Despite a U.S. freight rate that is approximately four times greater than the statutory rates (the Crow rate) in Canada (Table 6.1), U.S. grain producers realized a higher profit margin than the Canadian producer (8.8 cents per bushel for the 1977-1978 crop year) even though the quality difference would suggest a higher return to the Canadian grain producer (Western Business, August 4th, 11th, 1979).

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*"throughput system" refers to large capacity grain elevators that do not store grain; as grain is trucked in to the elevator, it is loaded into waiting hopper cars. For more information see "Rationalizing the Elevator System" - Grain Handling & Transportation Commission 1975.

TABLE 6.1

COMPARATIVE RAILWAY RATES ON GRAIN IN THE U.S.A. AND CANADA

Rail Rates and Distances From Montana Points to Seattle				Rail Rates and Distances from Alberta Points Along N.A.R. Lines to Vancouver			
Town	Distance In Miles	In Kms	Rate in Cents Per 45.36 Kg (100 lbs)	Town	Distance In Miles	In Kms	Rate in Cents Per 45.36 Kg (100 lbs)
Logan	771.7	1241	87 1/2	Edmonton	765.0	1247	20
Alder	778.9	1253.5	87 1/2	Carbondale	780.2	1255.5	20
Great Falls	798.7	1284.8	94	Mearns	798.4	1284.5	22
Havre	846.9	1363	101	Jarvie	844.2	1358.6	23
Glasgow	999.9	1609	124	Enilda	996.9	1604.5	25
Hogeland	1040.1	1673.5	120 1/2	Falher	1043.8	1678	26
Wolf Point	1049.5	1688	126	Girouxville	1049.4	1688	26
Cow Creek	1066.1	1715	128	Nampa	1063.8	1710.5	26
Snowden	1130.2	1818	130	Spirit River	1127.2	1813	26
Wilbaux	1192.1	1918	133 1/2	Huallen	1193.2	1919	28

SOURCE: Railroad Export Freight Rates: Wheat and Barley - Montana Pacific Northwest - Montana Wheat Research & Marketing Committee, Dept. of Agriculture, Helena, Montana, Rate Book No. 1, June 20, 1974.

SOURCE: N.A.R. Documents (see Appendix for Crow Rates)

It would appear, therefore, that despite the higher rail freight rates in the United States, grain producers there still out produce their Canadian counterparts. Obviously, the Canadian grain farmer relies very heavily on the exceedingly low cost of transporting grain to realize his net income than on his efforts to maximize production. Grain traffic could stand higher rail rates and it is very unlikely that the production of grain would be adversely affected. Wilson and Darby coraborate this point by stating that, "on the contrary, it is quite possible that the primary producer would increase his efforts and produce more in order to maintain his total income." (Wilson and Darby 1968). In other words, the statutory rates on grain have in fact encouraged a somewhat lethargic application of production techniques by the Canadian grain producer.

5. The most versatile method of moving goods is the universal container. It is a remarkably flexible transport instrument, capable of being shifted rapidly from a highway truck to a railway flatcar, the hold of a cargo vessel or even a large aircraft. It is the key to

shipments and the Container-on-Flat-Car (C.O.F.C.) should be used for all grain movement. For example, a thousand containers of graded wheat from farms in Falher, could be delivered to a destination in China in the same container. Hence, the use of the container-on-flat-car is a much better choice of capital cost investment, than grain hopper cars and box cars. The flat car is a more versatile vehicle than any other rail car and can be used for a variety of freight movements. Further, its low centre of gravity, lightweight and other technical advantages outweighs any advantages that other specialized railway rolling stock may exhibit.

6. Railways in Canada, and this includes the N.A.R., would do well to study the techniques utilized by the Soviet and Indian Railways with regard to maximum utilization of rolling stock, equipment and the incidence of turn-around-times for rail cars. This was admirably illustrated in a study by Holland Hunter, in which he states, "Soviet railroad men have developed numerous ways of greatly intensifying the use of their plant and equipment. Utilization factors have

been raised far above Western levels." (Hunter 1968). For example, the average turn around time for freight cars on the Soviet railways in 1966, was 5.3 days and on Indian railways, 9.5 days; on the N.A.R., it is over 14 days*. (Perry 1972).

7. The closure of the C.N. lines from Morinville to Athabasca, as advocated by the Hall Commission Report (1975) should be encouraged, as this would channel via trucks, freight movements to shipping points on either one of the N.A.R. lines.

Finally, the rapid and ever escalating costs of petroleum fuels for transportation enhances the reputation of the railway as being one of the most economical modes of transport not only for bulky freight items, but for passengers as well. Thus a resurgence of rail passenger traffic may well occur within the next two decades, and it would be wise for the N.A.R. (and other railways in Canada as well) to be prepared for this eventuality. The present rail system of the N.A.R. could link up with any number of the suburban L.R.T. terminals of the Edmonton Transit Service, thereby making rail travel into and out of Northern Alberta more attractive to the mobile populace. Recent political decisions affecting the costs of petroleum and diesel fuel could well make the fares by bus and airplane prohibitive as well as to

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*Mr. Ken Perry - Personal Interview

cause the private automobile to become a relic of the 20th Century. With this in mind, electrification of the railway system as well as the use of electric powered locomotives must be considered seriously. The N.A.R., and other railways in Canada, should not wait for the competition to acquire a head start as has happened earlier; on the contrary, it should capitalize on its inherent advantages and act with confidence. As Hunter confirms, "Clearly the major lesson of Soviet railroad experience is that railways are not obsolete. They have a tremendous potential.... A country with a first-class railway system has inherited an extremely valuable base for its economic growth. Railway difficulties in some mature economies should not be sweepingly misinterpreted to imply that the railroad era has ended." (Hunter 1968).

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APPENDICES

APPENDIX I

NORTHERN ALBERTA RAILWAYS COMPANY

ALTERNATIVE TRUCKING SERVICES PROVIDED IN THE AREAS SERVED BY TRAINS 1 & 2 BETWEEN EDMONTON (DUNVEGAN YARDS) ALTA. AND DAWSON CREEK, B.C.

1969 - 1970

Stations	Scheduled Truck Carriers	Frequency of Service
Morinville	CN Express	Tue. Thur. Sat. Daily
Alcomdale	McLaughlin Transfer	Mon. Wed. Fri.
Busby	McLaughlin Transfer	Mon. Wed. Fri.
Picardville	McLaughlin Transfer	Mon. Wed. Fri.
Westlock	Westlock Transport Ltd. Lux Transport	Daily ex. Sat.
Pibroch	Westlock Transport Ltd.	Mon. Wed. Fri.
Dapp	Westlock Transport Ltd.	Mon. Wed. Fri.
Jarvie	Westlock Transport Ltd.	Mon. Wed. Fri.
Fawcett	Westlock Transport Ltd.	Mon. Wed. Fri.
Flatbush	Hayes Enterprises Ltd.	Mon. Wed. Fri.
Chisholm	Hayes Enterprises Ltd. Hayes Transport	Mon. Wed. Fri.
Hondo	Hayes Enterprises Ltd.	Mon. Wed. Fri.
Smith	Hayes Enterprises Ltd.	Mon. Wed. Fri.
Spurfield	Hayes Enterprises Ltd.	Mon. Wed. Fri.
Slave Lake	Hayes Enterprises Ltd.	Daily
Wagner	Hayes Enterprises Ltd.	Mon. Wed. Fri.
Canyon Creek	Hayes Enterprises Ltd.	Daily

Stations	Scheduled Truck Carriers	Frequency of Service
Assineau	Hayes Enterprises Ltd.	Daily
Kinuso	Hayes Enterprises Ltd.	Daily
Faust	Hayes Enterprises Ltd.	Mon. Wed. Fri.
Driftpile	Hayes Enterprises Ltd. Hayes Transport	Mon. Wed. Fri.
Joussard	Hayes Enterprises Ltd. Spendiff Trucking	Mon. Wed. Fri.
Enilda	Spendiff Trucking	Daily
High Prairie	Spendiff Trucking	Daily
McLennan	Falher Transport Ltd.	Daily
Donnelly	Falher Transport Ltd.	Daily
Girouxville	Falher Transport Ltd.	Daily
Watino	Sanduls Transfer	Daily
Eaglesham	Sanduls Transfer	Daily
Codesa	Sanduls Transfer	Daily
Belloy	Sanduls Transfer	Daily
Wanham	Sanduls Transfer	Daily
Rycroft	Bell Bros. Transport Ltd. Grimshaw Trucking & Distributing Ltd. Reseneau Transfer Sanduls Transport	Daily Daily Daily Daily
Woking	Sanduls Transfer Grimshaw Trucking & Distributing Ltd.	Daily Daily

Stations	Scheduled Truck Carriers	Frequency of Service
Sexsmith	Bell Bros. Transport Ltd.	Daily
	Sanduls Transfer	Daily
	Grimshaw Trucking & Distributing Ltd.	Daily
Clairmont	Grimshaw Trucking & Distributing Ltd.	Daily
	Bell Bros. Transport Ltd.	Daily
	Sanduls Transfer	Daily
Grande Prairie	Canadian Freightways Ltd.	Daily
	Sanduls Transfer	Daily
	Grimshaw Trucking & Distributing Ltd.	Daily
	Bell Bros. Transport Ltd.	Daily
	MacKays Transport	Daily
Beaverlodge	MacKays Transport	Daily
	Bell Bros. Transport Ltd.	Dailyu
	Grimshaw Trucking & Distributing Ltd.	Daily
Hythe	Bell Bros. Transport Ltd.	Daily
	Grimshaw Trucking & Distributing Ltd.	Daily
Pouce Coupe	Canadian Freightways Ltd.	Daily
	Loiselle Transport Ltd.	Daily
Dawson Creek	Loiselle Transport Ltd.	Daily
	Boychuk's Transport Ltd.	Daily
	Canadian Freightways Ltd.	Daily
Waterways	Byers Transport	Daily
	Monarch Transport	Daily
Lac La Biche	Byers Transport	Daily
	Monarch Transport	Daily
Dawson Creek	Borstad (contract)	Daily
Grande Prairie	Borstad (contract)	Daily
Peace River	Borstad (contract)	Daily
High Prairie	Central Peace Dairies	Daily
Waterways	Rail to Lac La Biche	Daily

Stations	Scheduled Truck Carriers	Frequency of Services
Peace River to Hines Creek	Central Peace Dairies	Daily
High Prairie to Spirit River	Central Peace Dairies	Daily
Barrhead	Lux Transport of Westlock	Daily
Wembly	Grimshaw Trucking & Distributing Ltd.	Daily
Beaverlodge	MacKay's Transport	Daily
	Bell Bros. Transport Ltd.	Daily
	Distributing Ltd.	Daily

Freight - Express Operations

On May 29, 1965, the Company commenced handling freight and express by motor carrier operation on the highways. Five routes were in operation until March 22, 1971, when this service was reduced to three routes as follows: Route No. 1 - Sunday, Tuesday - Edmonton to Dawson Creek (includes Pouce Coupe). Route No. 2 - Monday, Tuesday, Wednesday and Thursday - Edmonton to Grande Prairie, Grande Prairie to Sexsmith via Wembley, Beaverlodge, Hythe via Grande Prairie Pick-up and Delivery. Route No. 3 - Daily except Sunday and Monday - Edmonton to High Prairie. Nampa and Peace River - Peace River to Graimshaw, Berwyn, Brownvale, Whitelaw, Bluesky, Fairview and Hines Creek. High Prairie to McLennan, Donnelly, Falher, Girouxville, Eaglesham, Wanham, Rycroft and Spirit River. Effective July 9, 1973, 2 pups are being used - 1 to High Prairie and 1 to Peace River.

Service is also provided daily, except Saturday and Sunday, via Hayes Enterprises Edmonton to Smith, Slave Lake, Kinuso, Faust and Chisholm. Service is provided daily to Westlock, except Saturday and Sunday, via McLaughlin. Edmonton to Barrhead - service is provided daily via Rod's Transport. Edmonton to Thorhild and Newbrook - service is provided daily via Thorhild Transport. Edmonton to Boyle - Service is provided daily via Joe's Transport.

APPENDIX II

SPECIAL RATES ON GRAIN FOR EXPORT UNDER THE CROWSNEST PASS AGREEMENT

	(Fort William Thunder Bay)		Vancouver Export		Vancouver Domestic		
	Divisions		Divisions		Divisions		
	Thru Rate	C.N. C.P.	Thru Rate	C.N. C.P.	Thru Rate	C.N. C.P.	Miles Thru
Albright	37.0	14.0	29.0	12.5	48.5	43.5	440.6
Alcondale	28.0	5.0	22.0	4.5	41.0	19.5	35.4
Arvilla	28.0	5.0	22.0	5.0	41.0	22.0	45.6
Barrhead	29.0	6.5	23.0	5.5	41.5	23.5	66.2
Beaverlodge	37.0	14.0	29.0	12.5	48.5	43.5	435.7
Belloy	34.0	11.5	26.0	10.5	46.0	39.5	334.1
Berwyn	34.0	12.0	16.0	10.5	46.0	40.0	339.7
Bluesky	34.5	12.0	26.0	10.5	47.0	40.5	360.2
Bon Accord	28.0	4.5	20.0	3.5	41.0	18.5	27.5
Boyle	29.0	6.5	22.0	6.0	41.5	27.0	91.7
Brownvale	34.5	12.0	26.0	10.5	46.0	40.5	345.9
Busby	28.0	5.0	22.0	4.5	41.0	19.5	40.1
Campbell	28.0	3.0	20.0	2.0	39.5	11.0	9.2
Carbondale	28.0	4.0	20.0	3.0	39.5	14.0	19.2
Clairmont	35.5	13.0	27.0	11.5	48.0	42.5	400.3
Codesa	34.0	11.5	26.0	10.5	46.0	39.5	327.6
Culp	33.0	11.0	26.0	10.0	45.5	38.0	293.1
Dapp	29.0	6.5	23.0	5.5	41.5	24.0	70.8
Dawson Creek	38.0	15.0	30.0	13.5	50.5	45.0	495.2
Dimsdale	36.0	13.5	28.0	12.0	48.0	43.0	415.7
Donnelly	33.0	10.5	26.0	9.5	45.5	38.0	275.1
Dreau	33.0	10.5	26.0	10.0	45.5	38.0	282.3
Dunvegan Yards	26.0	1.5	20.0	1.0	39.5	1.0	5.6
Eaglesham	33.5	11.5	26.0	10.5	46.0	39.5	320.5
Egremont	28.0	5.0	21.0	4.5	41.5	22.0	49.8
Ellscott	29.0	6.5	22.0	5.5	41.5	26.0	84.5
Enilda	32.0	9.5	25.0	9.0	44.5	35.0	231.9
Excelsior	28.0	4.5	20.0	3.5	39.5	17.0	21.9
Fairview	35.0	12.5	26.0	10.5	47.0	41.0	365.8
Falher	33.0	10.5	26.0	10.0	45.5	38.0	278.8
Fawcett	29.0	6.5	23.0	6.0	41.5	26.0	87.1
Fedorah	28.0	5.0	20.0	4.0	41.0	19.5	35.7
Gage	35.0	12.5	26.0	10.5	48.0	41.0	373.2
Girouxville	33.0	10.5	26.0	10.0	45.5	38.0	284.4
Grande Prairie	35.5	13.0	28.0	12.0	48.0	42.5	406.9
Grimshaw	34.0	11.5	26.0	10.5	46.0	39.5	333.7

	(Fort William Thunder Bay)		Vancouver Export		Vancouver Domestic		
	Divisions		Divisions		Divisions		
	Thru Rate	C.N. C.P.	Thru Rate	C.N. C.P.	Thru Rate	C.N. C.P.	Miles Thru
High Prairie	32.0	10.0	25.0	9.0	44.5	35.0	239.2
Highridge	28.0	5.5	22.0	5.0	41.5	22.0	52.4
Hines Creek	35.0	23.0	27.0	11.0	48.0	41.0	381.8
Huallen	37.0	14.0	28.0	12.0	48.5	43.0	428.2
Hythe	37.0	14.0	29.0	12.5	48.5	43.5	445.3
Jarvie	29.0	6.5	23.0	5.5	41.5	24.0	79.2
Judah	33.5	11.5	26.0	10.0	46.0	38.5	310.2
Kinuso	31.0	9.0	25.0	8.5	44.0	33.5	196.1
Lac La Biche	29.5	7.5	23.0	7.0	42.0	30.0	132.3
Lymburn	37.0	14.0	29.0	12.5	49.0	43.5	454.4
Manola	29.0	5.5	23.0	5.0	41.5	22.5	58.7
McLennan	32.5	10.5	26.0	9.5	45.5	37.5	267.1
Mearns	28.0	4.5	22.0	4.0	41.0	18.5	33.4
Morinville	28.0	4.0	20.0	3.5	39.5	17.5	24.9
Nampa	33.5	11.0	26.0	10.0	46.0	38.5	298.8
Newbrook	29.0	6.5	22.0	5.5	41.5	24.0	72.1
Peace River	33.5	11.5	26.0	10.5	46.0	39.5	317.0
Pibroch	29.0	5.5	23.0	5.5	41.5	23.5	64.4
Picardville	28.0	5.0	22.0	5.0	41.5	22.0	48.6
Pouce Coupe	38.0	14.5	30.0	13.5	50.5	45.0	489.2
Prestville	34.5	12.0	26.0	10.5	47.0	40.5	352.9
Reno	33.0	11.0	26.0	10.0	45.5	38.0	292.5
Rycroft	34.5	12.0	26.0	10.5	47.0	40.5	357.0
Sexsmith	35.5	13.0	17.0	11.5	48.0	42.5	393.3
Spirit River	34.5	12.0	26.0	10.5	47.0	40.5	362.2
Thorhild	28.0	5.5	22.0	5.0	41.5	22.5	58.1
Wanham	34.0	12.0	26.0	10.5	46.0	40.0	340.4
Watino	33.5	11.0	26.0	10.0	46.0	38.5	303.1
Wembley	36.0	13.5	28.0	12.0	48.0	43.0	422.0
Westlock	28.0	5.5	22.0	5.0	41.5	22.5	57.2
Whitelaw	34.5	12.0	26.0	10.5	47.0	40.5	353.1
Woking	35.0	12.5	26.0	10.5	47.0	41.0	370.1

Rapeseed and Flaxseed: Increase of 1 1/2¢ per hundred lbs

APPENDIX III

CHARTERS AUTHORIZING CONSTRUCTION OF RAILWAYS

Name	From	To	Date of Construction	Authority	Remarks
Edmonton, Dunvegan & British Columbia Rly. Co.	Edmonton	Spirit River	1913-16	6-7 Ed. VII, Ch. 85, Sec. 7, 22 Mar. 1907	These lines were managed by Canadian Pacific under agreement with Prov. of Alta. from 21 July, 1920 to 11 November, 1926
- Spirit River Br.	Spirit River	Grande Prairie	1915-16	5 Geo. V, Ch. 42, Sec. 1, 8 Apr. 1915	
- Grande Prairie Westerly Br.	Grande Prairie	Wembley	1923-14	12-13 Geo. V, Ch. 57, Sec. I, 28 June 1922	
- "	Wembley	Hythe	1928	18-19 Geo. V, Ch. 59 Sec. I-b, 11 June 1928	Built by Northern Alta. Railways
- "	Hythe	Dawson Creek	1930-31	"	
Central Canada Rly. Co.	McLennan	Peace River	1914-19	4 Geo. V, Ch. 46, Alta., 25 Mar. 1913	These lines were managed by Canadian Pacific under agreement with Prov. of Alta. from 21 July, 1920 to 11 November, 1926
- Main Line	Peace River	Berwyn	1921	4 Geo. V., Ch. 46, Sec. 6, 25 Mar. 1913	
- "	Berwyn	Whitelaw	1923-24	"	
- "	Whitelaw	Fairview	1928	"	Built by Northern Alta. Railways
- "	Fairview	Hines Creek	1930	"	

Name	From	To	Date of Construction	Authority	Remarks
Alberta & Great Water-Way Rly. Co.	Carbondale	Lac La Biche	1915	9 Ed. VII, Ch. 46, Sec. 4, 25 Feb. 1909	Built and operated by Prov. of Alta. until incorporated into N.A.R.
- Main Line	Lac La Biche	Draper	1915-21	"	
- "	Draper	Waterways	1925	"	
The Pembina Valley Rly. Co.	Busby	Barrhead	1927	16-17 Geo. V., Ch. 62 Sec. 2, Alta., 8 Apr. 1926	Built and operated by Prov. of Alta. until incorporated into N.A.R.

APPENDIX IV

SELECTED SOIL SURVEY REPORTS

Soil surveys of differing degrees of intensity have been carried out by the Research Council of Alberta and a brief summary is appended.

Basic classification is by colour. Main classes in decreasing order of potentiality are: Black, Shallow Black, Dark Brown, Brown, Grey Wooded. Soil Survey reports take into consideration four additional factors: Profile Variation, Density, Stoniness and Topography.

Research Report	Year	Name of Sheet	Pasture &	Wooded	Doubtful Arable	Arable
23	1929	Dunvegan West	W3	W2	W1	Park-land A 2
31	1931	Peace River High River Sturgeon	W3	W2	WI	Park-land A 2
56	1947	Rycroft Watino	P	W	4	5,6,7
63	1950	High Prairie	P	W	4	5,6,7
74	1954	Grande Prairie Sturgeon	P	W	4	5,6,7
Unpublished	1956	Blueberry	P	W	4	5,6,7

Most detailed soil surveys are 56, 63, 76.

Most of the land available for settlement and agriculture is in the Peace. Except for this the only other land open for settlement is 234,000 acres available north and west of Lac La Biche.